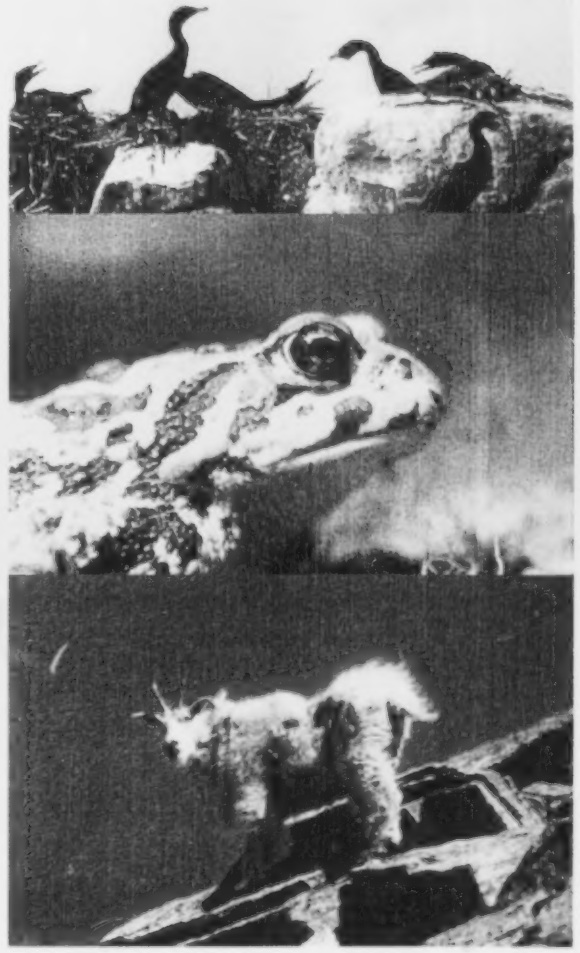
Interim Wildlife Guidelines for Commercial Backcountry Recreation in British Columbia

Chapter 1

Using Interim Wildlife Guidelines for Obtaining Commercial Backcountry Recreation Tenures in British Columbia



Pelagic Cormorants
Photo: BC Parks

Northwest Toad
Photo: BC Parks

Mountain Goat
Photo: J. Guy Bergeron

BRITISH COLUMBIA

Ministry of Water, Land and Air Protection
May, 2002

Biodiversity Branch
Ecosystem Planning and Standards Section
Email Ecosystem.Planning@gems3.gov.bc.ca

Interim Wildlife Guidelines for Commercial Recreation: **Using the Guidelines**

TABLE OF CONTENTS

105-03554/

I. PREFACE 1

II. INTRODUCTION 1

III. MANAGEMENT OF COMMERCIAL RECREATION IN BRITISH COLUMBIA 2

IV. PURPOSE OF INTERIM WILDLIFE GUIDELINES 2

V. APPLICATION FOR LAND TENURE USING INTERIM WILDLIFE GUIDELINES 3

VI. MANAGEMENT PLANS 4

VII. ASSESSING POTENTIAL IMPACTS ON WILDLIFE AND HABITAT 5

VIII. SOURCES OF INFORMATION 7

APPENDIX 1: SPECIES AND HABITATS OF CONCERN 9

I. PREFACE

Potential impacts on wildlife can be avoided or mitigated through careful site assessment, planning and management of Commercial Recreation operations.

This guide is to assist Applicants to Land and Water BC (LWBC, formerly BCAL) for Commercial Recreation (CR) tenure over Crown land, in preparing an Application that addresses potential impacts of CR operations on sensitive wildlife resources. It presents steps to preparing a complete application that meets wildlife objectives through the use of recommended guidelines to prevent or mitigate the potentially adverse effects of CR activities on wildlife and wildlife habitats in the backcountry. By assisting preparation of complete applications, the guide will also enable the Ministry of Water, Land and Air Protection (WLAP) and LWBC to provide more streamlined, consistent and timely responses to applicants for CR tenure.

II. INTRODUCTION

British Columbia offers some of the finest outdoor recreation opportunities in the world.

The Province has a wide range of scenic landscapes, ranging from oceanic to freshwater to dramatic mountain ranges. The Province's ecological variety is broad, including desert-like shrub-steppes, temperate rain forests and expansive areas of alpine tundra. The fauna is the most varied in Canada, including almost all the large mammalian species to be found in North America. These species are found in numbers and settings that are among the most natural found anywhere in the world. With its spectacular natural scenic landscapes and biological diversity, British Columbia's outdoor recreation opportunities are well known. Not surprisingly, British Columbia attracts visitors from around the world.

In concert with a worldwide trend, outdoor recreation is a growing area of the provincial economy.

Ecotourism and adventure travel are among the fastest growing components of the BC tourism sector. Commercial backcountry recreation is defined to include all forms of outdoor recreation activities authorized by the provincial government on Crown land on a fee-for-service basis. It covers a wide range of activities such as guided:

- Heli-skiing,
- heli-hiking,
- snowmobiling,
- Wildlife viewing
- sea kayaking.

The increasing demand for backcountry recreation has created many opportunities for entrepreneurs. As a result, this commercial activity is growing rapidly, and is occurring almost entirely on Crown Land since most of the province is publicly owned. This rapid increase of CR in recent years has raised concerns that unregulated growth may adversely affect the same features of the natural environment that CR activities depend on.

Scientific literature and experience show that some activities associated with accessing backcountry areas can affect sensitive wildlife and wildlife habitat.

Wildlife responses to disturbance may be behavioural (abandonment of preferred habitat) or physiological (stress). Over time, repeated disturbance may hurt wildlife by interrupting feeding or breeding behaviour, reducing vigour or productivity, or causing death. In the long term, negative impacts to wildlife may result in reduced populations. The impacts of CR activities depend on factors such as: the type of activity; the frequency, intensity and duration of the activity; the type of transportation (motorized or non-motorized); geographic location; and sensitivity of the wildlife and wildlife habitat in the area.

These Interim Wildlife Guidelines are based on best current practices in BC and elsewhere.

The Guidelines should be useful in assisting government officials[1] and CR operators in planning and managing commercial backcountry recreation. The purpose is to avoid and/or lessen the risks of CR activities on wildlife and contribute to the environmentally sustainable development of the industry. These Guidelines are designed to be useful in Crown land tenuring and planning processes. They do not address consumptive recreational pursuits such as hunting, or other activities such as mining or forestry. In order to remain consistent with the jurisdictional responsibilities of WLAP, marine mammals such as whales and seals are not addressed in these guidelines.

Generally, most recreational use of public lands has little impact on wild animals, plants, and their habitats.

This is particularly true of the "traditional" ways of enjoying the outdoors through hiking and canoeing. However, an increasing use is being made of motorized vehicles to access and tour wilderness settings. If this use is concentrated enough in space and time, particularly in areas that support

[1] Such as those in Ministry of Water, Land and Air Protection, Ministry of Sustainable Resource Management, and Land and Water British Columbia

sensitive wildlife populations or habitats, then adverse impacts to wildlife and wildlife habitats can occur.

According to the Wildlife Policy of Canada, wildlife means all living wild organisms. However, the literature on effects of recreational activities on wildlife focuses largely on vertebrates, particularly large terrestrial mammals and large birds. Very little information exists on fish, reptiles, and amphibians, and even less on invertebrates and other animal life. Information exists about the impacts on terrestrial plant communities, but it has mainly been conducted in high-use areas of parks.

There is a great deal of information on the impacts of recreational activities on certain species of wildlife.

Not all of this information is readily available. However, for some species and species groups, there are a significant number of published accounts addressing the impacts of disturbance. Guidelines for these species are supported by the best available information in the published literature, taking into account approaches adopted by other management agencies.

Notwithstanding the large information base, many aspects of the issue are still unstudied. Given the number of wildlife species of concern, the many types of backcountry recreational activities and the variety of modes of accessing the backcountry, it is not surprising that gaps still exist. For some species and species groups, published accounts are limited or non-existent. Accordingly, Guidelines for these species are based on general principles and knowledge about wildlife, and use approaches adopted by other management agencies. In these cases, recommendations for limiting impacts are more dependent on the species life history and habitat requirements, as well as the judgment and experience of professional biologists.

III. MANAGEMENT OF COMMERCIAL RECREATION IN BRITISH COLUMBIA

Most CR businesses in BC operate on Crown land and are regulated under the Commercial Recreation on Crown Land Policy.

A license of occupation, issued under Section 39 of the *Land Act*, is the form of tenure used to authorize commercial recreation use of Crown land for a term of greater than two years over an extensive area, which may also involve intensive use of small sites. Applicants are required to submit an Application to LWBC, including a draft Management Plan, for the term of the tenure.

The provincial Land Act requires individuals who want to use Crown land for CR purposes to apply for tenure to do so.

LWBC issues these tenures. Recognizing the need to manage the increasing numbers of operators, the Commercial Recreation on Crown Land policy (see http://lwbc.bc.ca/CLB/pdf_files/crfinal.pdf) was developed and introduce for full implementation in 1998. The Commercial Recreation policy applies to all forms of outdoor recreation activities authorized by LWBC on provincial Crown land in a provincial forest and Crown land covered by saltwater and freshwater, on a fee-for-service basis. LWBC does not have jurisdiction over forest service roads and campsites, provincial parks or water corridors.

The Commercial Recreation policy provides for a number of tenuring options, including licenses, permits, and leases.

The approval or adjudication process for Crown land tenures for CR involves the referral and review of applications as appropriate by key agencies, which may include regional WLAP staff. The general public is consulted through advertisement. WLAP may assess the applications for how well they maintain the existing environment and protect important biological features. Tenures are required to incorporate environmental management provisions consistent with approved land use plans and environmental guidelines.

The approval process for recreation activities within provincial parks and protected areas is different from that for Crown land outside parks.

Interested parties must approach BC Parks and Protected Areas directly. Environmental guidelines such as these would generally apply within parks as well.

These current Guidelines do not apply to public recreation although the intent is that, over time, environmental impacts caused by public recreation will also be addressed and mitigated. The mechanisms for achieving this would be different than for CR.

IV. PURPOSE OF INTERIM WILDLIFE GUIDELINES

These Guidelines summarize available information on the impacts of non-consumptive outdoor recreational activities on wildlife, and serve as recommended practice for CR tenure applicants and holders.

Given the rapid increase in CR in recent years, and the potential for unregulated recreational activities to damage sensitive wildlife and wildlife

habitat, these Guidelines were needed in order to meet the program goals of the Ministry of Water, Land and Air Protection.

The goals of the Ministry of Water, Land and Air Protection include the "protection, conservation and restoration of a full range of biological and physical diversity native to British Columbia" and the "provision of social, economic and outdoor recreation opportunities consistent with maintaining a naturally diverse and healthy environment".

Guidelines are defined as "a set of recommended or suggested methods or actions that should be followed in most circumstances to assist administrative and planning decisions, and their implementation in the field"[2]. They are provided as a broad framework of recommended actions to be taken and, therefore, provide some flexibility for decision-making. They should also assist in the preparation of management plans that protect wildlife while carrying on CR activities.

These Guidelines focus on particular wildlife species and habitats of particular concern in the province because they are at high potential risk of disturbance from commercial recreation.

Most of these species are red- or blue-listed (i.e. threatened, endangered or vulnerable) or otherwise regionally significant. The Guidelines are based on current practices in B.C. and elsewhere, scientific literature on the potential adverse effects of CR on wildlife, and expert opinion.

These Guidelines will assist in planning and managing CR in the backcountry.

They will:

- Provide CR operators and LWBC with an overall picture of WLAP's key concerns about the potential impacts of recreation to wildlife, wildlife habitat and biodiversity;
- Advise CR applicants of WLAP's possible concerns at the conceptual stage of new CR proposals prior to large capital investments;
- Provide Ministry staff with clear and consistent guidelines for reviewing CR applications;
- Demonstrate provincially consistent application of wildlife management criteria, providing greater clarity and certainty for operators;
- Provide CR operators with an early indication of any wildlife inventory and environmental assessment required for timely adjudication of proposals;
- Outline acceptable impact avoidance/mitigation measures;
- Assist in focusing new CR development in areas with the least impact on wildlife and wildlife habitat; and,
- Build public confidence in the stewardship role of government and CR operators in ensuring a sustainable environment.

V. APPLICATION FOR LAND TENURE USING INTERIM WILDLIFE GUIDELINES

A generalized approach for proponents to address wildlife issues through the Crown land tenure process is:

1. Proponent contacts regional WLAP staff and the BC Conservation Data Centre (see Section VIII) regarding wildlife resources, and rare and endangered species' occurrence in a proposed or operating land tenure area. Additional information may be available on government web sites.
2. For major projects[3], the Proponent will contract with a qualified biologist (RPBio or equivalent) to review existing species / habitat information and to assess the potential effects of the proposed CR operation on wildlife.
    a. The qualified practitioner will review the Guidelines to identify information needs and operational practices required to complete the management plan, and will review existing species and habitat information and arrange for collection of new information as required.
3. Proponent is responsible for developing an Application including a CR Management Plan (see Section VI) containing mitigation strategies for wildlife resources potentially affected.
4. Proponent submits application and management plan to LWBC, who may refer it to interested parties for review. Regional WLAP staff will review proposals for major projects.
5. Depending on the risk assessment, LWBC may indicate that additional wildlife/habitat studies may be required prior to a decision for acceptance of the management plan.
6. Proponent receives CR tenure based on the proposed CR Management Plan, which then becomes binding.

[2] Dunster, J., & Dunster, K. (1996). *Dictionary of natural resource management*. Vancouver, BC: UBC Press.

[3] A major project includes the construction of permanent facilities, the extensive use of motorized transportation equipment, or the potential of large number of clients.

7. Government and/or others may monitor the compliance with and effectiveness of wildlife mitigation strategies as stipulated in CR tenure documents.
8. Government may direct modifications of the wildlife mitigation strategies as necessary based on results of compliance and effectiveness monitoring.

Most of the Guidelines are expressed as performance-based objectives rather than rigid prescriptions.

Where specific strategies are recommended, these are to be read as guidelines rather than fixed rules. These guidelines will assist WLAP and or LWBC staff in evaluating how well new CR management proposals address specific wildlife and habitat interests. LWBC staff will use flexibility in applying these Guidelines in assessing CR tenure proposals.

Proponents will be encouraged to utilize the guidelines and apply them to their existing or proposed activities and projects, taking into consideration site-specific factors.

Proponents may request a variance from LWBC, allowing them to deviate from the guidelines, when they can demonstrate that their particular proposal can meet environmental objectives equally well in other ways.

Other variables that need to be considered include topography, seasonality and frequency of use by humans and wildlife, and sensitivity of particular habitats and animal species to human disturbance.

WLAP staff will, when possible, work with LWBC and proponents to seek alternatives consistent with the intent of the guidelines. For example, if a physical barrier that would minimize disturbance could separate helicopter flight-related activity that is part of a CR operation, the flight set-back guidelines could be varied as appropriate. As well, distance interval restrictions may be periodically relaxed for specific circumstances such as safety concerns or inclement weather. In other instances, where the guidelines are less prescriptive, the expectation is for the proponent to demonstrate the proposed management approach is consistent with the intent of the guidelines. The results-oriented guidelines allow for a range of solutions.

WLAP will make appropriate ministry wildlife inventory and habitat information available to CR proponents for use in preparation of applications and management plans.

The guidelines are primarily for use in guiding new applications for CR tenure. Special consideration will be provided and flexibility given to existing businesses to minimize, when appropprate, impacts on their ongoing operations. The same consideration will also be given to existing tenured CR businesses at the time of tenure renewal. In some instances, existing CR tenures contain clauses that allow for amendments to management practices of an operation. Where the current management practices vary from the recommendations in the guidelines, LWBC and, when possible, WLAP, will work with the operators to move towards improved operating practices making best efforts to ensure their continued economic viability.

The guidelines will evolve over time.

Things will change as new scientific information and experience are gained and new ways are found to operate in the backcountry while minimizing disturbance or stress to wildlife. These guidelines will be implemented using the principles of adaptive management[4], so wildlife values can be protected at the same time that monitoring and research is used to validate and improve the various protective and mitigative measures. Monitoring the effectiveness of harm-reducing strategies is critical to a flexible and adaptive management approach. To make the guidelines work effectively will require a collaborative approach by the CR industry, CR clients, the public and government.

VI. MANAGEMENT PLANS

A Management Plan is a combination of text and maps that form part of an Application and become components of a legal agreement between LWBC and the tenure holder.

Part of the *Commercial Recreation on Crown Land Policy*, a Management Plan consists of descriptions of the specific nature of the CR operation, including the boundaries within which the operation may occur, and the conditions, provisions, restrictions and guidelines for use of Crown land for such an operation.

A Management Plan must:

1. Specify and justify the proposed area(s), purpose, terms and conditions,

[4] Experimenting scientifically with alternative management strategies on a limited scale that will not cause large/irreversible impacts, and in a manner that will reveal which management approach is preferred (i.e. active management experiments with monitoring and a feedback loop to management decision-making). For example, see http://www.for.gov.bc.ca/hfp/amhome/introgd/toc.htm, *An Introductory Guide to Adaptive Management For Project Leaders and Participants*.

2. Establish level of use, including number of clients on a monthly and annual basis;
3. Specify measures to eliminate or minimize conflicts with existing interests in the area;
4. Specify measures to: protect environmental integrity; ensure public access is maintained; ensure affected parties' interests are protected; and, minimize/ mitigate impacts on other resource users.

For major projects only, WLAP may consider and assess proposals for mitigation of significant potential impacts on wildlife and significant habitat. In reviewing the size and configuration of an application area, among other things, the Ministry must be satisfied that the Management Plan excludes or provides mitigation for areas of significant environmental concern.

Approved Management Plans act as the basis for monitoring specific performance requirements, such as "diligent use" of the tenure area, environmental management and reporting procedures.

VII. ASSESSING POTENTIAL IMPACTS ON WILDLIFE AND HABITAT

In preparing a Management Plan to minimize the effects of the proposed CR operation on sensitive wildlife and wildlife habitats, it is important to plan in a manner that first identifies:

1. whether, where and when there are sensitive wildlife and habitat values in the proposed operating area;
2. potential adverse effects of the proposed facilities and activities on those values (i.e. risks); and,
3. mitigation options.

This information is then used in designing the layout of built facilities, setting the boundaries and timing of recreation activities and establishing the conditions of operation to avoid or minimize negative effects on wildlife resources.

How to Identify Sensitive Wildlife Values

A Proponent only needs to consider species and habitats of special management concern listed in the Guidelines that occur in their proposed operating area.

In most cases only a few of the species or habitats, and related best management practices, will apply to any single operation in any region of the province.

There is a wide variety of sources of information on species and habitats in the province.

Information for a particular proposed operating area may be available from existing data sources, such as from the CDC. Assistance and advice on species of concern and data sources for a particular proposed operating area may be obtained from Regional WLAP and CDC staff. Species and habitats of concern for adverse impacts from CR are listed in Appendix I. See Section VIII for sources of information on wildlife and for the locations of Regional WLAP offices.

For major projects, LWBC may recommend that the applicant obtain the appropriate information required to adequately assess and plan the proposed operation.

Depending on the nature and size of a proposal and for sites without wildlife or habitat inventory information or with inventory data that is too incomplete to assess potential impacts of CR operations, LWBC may recommend that an inventory be done by a qualified biological consultant. Regional WLAP offices can provide a list of qualified consultants. The objective is to identify sensitive species and sites, and critical times in a species' life history, such as calving, nesting, spawning etc.

Potential Adverse Effects

The level of wildlife inventory and mitigation required for a particular operation is linked to the magnitude of impacts posed by the proposed CR activities.

The potential magnitude of impact is a function of the sensitivity of the wildlife species and habitats in the area; the type of activity (e.g., motorized vs. non-motorized travel); the frequency, intensity and duration of the activity; and the geographic location.

The potential adverse impacts of CR on wildlife resources vary greatly depending on the:

type of recreation	method of travel
geographic location	wildlife species present
time of year	predictability of the activity
and perhaps most importantly, the frequency of the activity	

In general, use of motorized vehicles, including helicopters, snowmobiles, off-highway vehicles, personal watercraft and jet boats, has a greater likelihood of disturbing wildlife and physically damaging vegetation and

soils than non-motorized forms of transportation such as hiking, horseback riding and canoeing.

However, even relatively low impact activities can have negative impacts. For example, rock climbing near cliff-nesting birds or caving in winter bat hibernacula can stress or displace the animals, and high numbers of hikers randomly walking off trails in alpine meadows can damage sensitive soils and vegetation.

The amount of information required to address wildlife issues in a Management Plan should reflect the risk presented by the proposal.

Mitigation

Wildlife species or habitats of concern that could be adversely affected by the proposed CR operation will need protection or impact mitigation measures to avoid or minimize the impacts.

Mitigation and protection measures should be incorporated into the CR Management Plan. Guidelines that recommend methods to mitigate potential impacts of CR activities on wildlife and wildlife habitat of concern are viewable at: http://wlapwww.gov.bc.ca/wld/comrec/crecintro.html.

The overall objective of the Guidelines is to maintain the abundance and distribution of wildlife species.

The Guidelines are organized by group (mammals, birds, amphibians and reptiles, plant communities) and then by species, with impact mitigation guidelines then identified for individual species of ungulates, carnivores, seabirds, etc. For each species, the key concerns are identified. The concerns can be habitat-related, such as those areas used by animals at critical times in their annual life cycle (e.g. winter ranges for ungulates or breeding sites for colonial nesting birds). Key issues can also refer to particular aspects of a species' biology that make them vulnerable or sensitive to human activities, such as a hypersensitivity to stress or times of large aggregations.

The guidelines are flexible and results oriented. Applicants may propose alternative management approaches to LWBC that are consistent with the objective of the guidelines.

VIII. SOURCES OF INFORMATION

Rare and endangered species and plant communities

BC Conservation Data Centre

The British Columbia Conservation Data Centre (CDC) provides a centralized data source for location information on red- and blue-listed animal and plant species and plant communities. The CDC has collected information from museums, herbaria, universities, published and unpublished reports, theses, scientists, natural history groups, and the ongoing work of its own staff and contractors. Location and status information of rare and endangered species and plant communities is available to anyone making a written request. In most cases this information can be made available within one week.

The Endangered Species in British Columbia web site (srmwww.gov.bc.ca/atrisk/index.html) provides a link to the *BC Species Explorer*, a state-of-the-art on-line database with information about species at-risk in BC.

The CDC can be contacted as follows:

By Mail BC Conservation Data Centre Ministry of Sustainable Resource Management P.O. Box 9993 STN PROV GOVT Victoria, BC V8W 9R7	By Phone Tel: (250) 356-0928 – toll free through Enquiry BC Fax: (250) 387-2733
By Computer Email: cdcdata@victoria1.gov.bc.ca Website: srmwww.gov.bc.ca/cdc/	

Key Documents

Information on the distribution, status, biology and conservation needs of rare and endangered wildlife resources (red- and blue-listed species) are available from a large variety of sources. General information is available:

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (www.crownpub.bc.ca/) for $26.00, Inventory Number 605.

Douglas, G. W., Straley, G. B., & Meidinger, D. V. (1998). *Rare native vascular plants of British Columbia*. Victoria, BC: Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks.

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (www.crownpub.bc.ca/) for $30.00, Inventory Number 600.

Harding, L. E., & McCullum, E. (Eds.). (1994). *Biodiversity in British Columbia: Our changing environment*. Ottawa: Environment Canada, Canadian Wildlife Service.

Species of Management Concern

Information on the distribution, status, biology and conservation needs of regionally significant and other wildlife species can best be located through discussions with wildlife and habitat protection biologists located in regional WLAP offices.

Region 1 - Vancouver Island 2080-A Labieux Road NANAIMO BC V9T 6J9 Tel: (250) 751-3100 Fax: (250) 751-3103	Region 2 – Lower Mainland 2nd Floor, 10470 – 152 Street SURREY BC V3R 0Y3 Tel: (604) 582-5200 Fax: (604) 930-7119
Region 3 – Southern Interior 1259 Dalhousie Street KAMLOOPS BC V2C 5Z5 Tel: (250) 371-6200 Fax: (250) 828-4000	Region 4 – Kootenay #401 – 333 Victoria Street NELSON BC V1L 4K3 Tel: (250) 354-6333 Fax: (250) 354-6332
Region 5 – Cariboo Ste. 400 – 640 Borland Street WILLIAMS LAKE BC V2G 4T1 Tel: (250) 398-4530 Fax: (250) 398-4214	Region 6 – Skeena Bag 5000, 3726 Alfred Avenue SMITHERS BC V0J 2N0 Tel: (250) 847-7303 Fax: (250) 847-7728
Region 7 – Omineca/Peace 3rd Floor, 1011 – 4th Avenue PRINCE GEORGE BC V2L 3H9 Tel: (250 565-6135 Fax: (250) 565-6629	

Terrestrial ecosystems and wildlife habitats

Maps of terrestrial ecosystems and wildlife habitat interpretations are available for much of the province at various scales ranging from 1:5000 to 1:250,000. Regional offices of Ministry of Water, Land and Air Protection will be aware of ecosystem and habitat maps available for particular areas of interest (see list above). As well, the Terrestrial Information Branch of the Ministry of Sustainable Resource Management may have additional wildlife habitat mapping available for certain areas of the province.

Terrestrial Information Branch
Ministry of Sustainable Resource Management
PO BOX 9993 STN PROV GOVT
VICTORIA V8W9R7
Phone: (250) 387-1314
srmwww.gov.bc.ca/rib/wis

Coastal sensitive ecosystem inventory

The sensitive ecosystem inventory (SEI) is a joint project of Environment Canada and the Ministry of Sustainable Resource Management. It covers the coastal lowlands of east Vancouver Island, the adjacent Gulf Islands, and Sunshine Coast. The purpose of the SEI is to identify, map and evaluate remnants of rare and fragile ecosystems, and to encourage responsible land use decisions to help ensure the continued integrity of these ecosystem types. SEI information is intended to be used in a variety of land use decisions. SEI data is available in paper copy or in electronic form. Further information can be obtained from the SEI website (srmwww.gov.bc.ca/cdc/sei/index.htm).

MWLAP recommends that proponents use the SEI to determine if the proposed tenure lies within or adjacent to a sensitive coastal ecosystem.

South Okanagan sensitive ecosystem inventory

Similar to work being done on the coast, this project describes sensitive ecosystems through the south Okanagan and the lower Similkameen regions. The publication can be viewed at wlapwww.gov.bc.ca/sir/fwh/wld/atlas/index.html.

Other sources of information

Various types of additional information are available from regional WLAP offices, such as nest site data and annual monitoring reports for bird species identified in Section 34 of the Wildlife Act (e.g., bald eagles, great blue herons, ospreys, peregrine falcons and goshawks).

Freshwater fish inventories compiled from lake and stream surveys. Please see the FishWizard website (www.fishwizard.com) for the Fish Inventory Stream Summary (FISS) database.

APPENDIX 1: SPECIES AND HABITATS OF CONCERN

MAMMALS	*UNGULATES*	Bighorn Sheep (California & Rocky Mountain) and Thinhorn Sheep (Dall's & Stone's)
		Bison
		Caribou
		Mountain Goat
	CARNIVORES	Badger
		Cougar
		Fisher
		Gray Wolf
		Grizzly Bear
		Lynx
		Wolverine
		Sea Otter
	BATS	Fringed Myotis
		Keen's Long-eared Myotis
		Northern Long-eared Myotis
		Pallid Ba
		Spotted Bat
		Townsend's Big-Eared Bat
		Western Red Bat
		Western Small-footed Myotis
	RODENTS	Red- and Blue-listed
		Cascade Mantled Ground Squirrel
		Great Basin Pocket Mouse
		Least Chipmunk – *orocetes* ssp
		Least Chipmunk – *selkirki* ssp
		Meadow Jumping Mouse – *alascensis* ssp
		Mountain Beaver - *rainieri* ssp
		Mountain Beaver – *rufa* ssp
		Northern Bog Lemming – *artemisiae* ssp
		Northern Pocket Gopher – *segregatus* ssp
		Red-tailed Chipmunk *ruficaudus* ssp
		Red-tailed Chipmunk – *simulans* ssp
		Southern Red-backed Vole *galei* ssp
		Southern Red-backed Vole *occidentalis* ssp
		Townsend's Vole – *cowani* ssp
		Western Harvest Mouse
		Vancouver Island Marmot
BIRDS	*SONGBIRDS*	Bay-breasted Warbler
		Black-throated Green Warbler
		Brewer's Sparrow -*breweri* ssp
		Bobolink
		Canada Warbler
		Canyon Wren
		Cape May Warbler
		Connecticut Warbler
		Grasshopper Sparrow
		Gray Flycatcher
		Lark Sparrow
		Nelson's Sharp-tailed Sparrow
		Philadelphia Vireo
		Pine Grosbeak -*carlottae* ssp
		Purple Martin
		Sage Thrasher
		Smith's Longspur
		Steller's Jay -*carlottae* ssp
		Vesper Sparrow -*affinis* ssp
		Yellow-breasted Chat

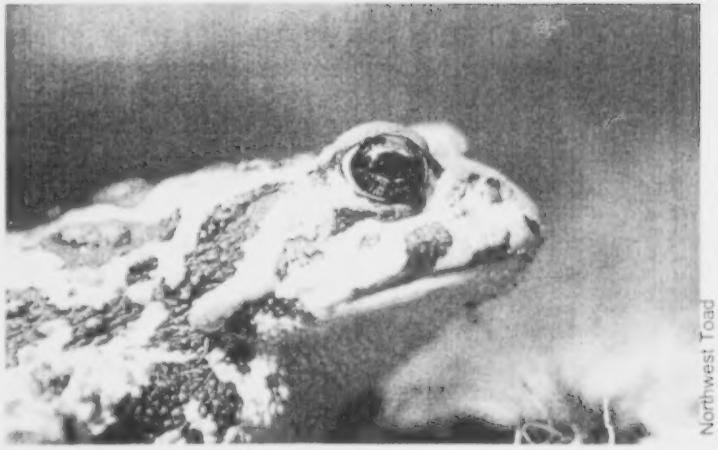
	SEA BIRDS	Brandt's Cormorant
		Pelagic Cormorant - *pelagicus* ssp
		Double-crested Cormorant
		Common Murre
		Thick-billed Murre
		Ancient Murrelet
		Cassin's Auklet
		Horned Puffin
		Tufted Puffin
	SHOREBIRDS	Great Blue Heron
		American Avocet
		Long-billed Curlew
		American Golden-Plover
		Hudsonian Godwit
		Red-necked Phalarope
		Short-billed Dowitcher
		Wandering Tattler
		Upland Sandpiper
	FRESHWATER BIRDS	Western Grebe
		American White Pelican
		Harlequin Duck
		American Bittern
		Sandhill Crane
	RAPTORS	Gyrfalcon
		Peregrine Falcon - *anatum* ssp
		Prairie Falcon (RED) *pealei* ssp
		Broad-winged Hawk
		Ferruginous Haw
		Northern Goshawk-*laingi* subspecies
		Swainson's Hawk
		Flammulated Owl
		Northern Pygmy-Owl- *swarthi* ssp

		Northern Saw-whet Owl- *brooksi* ssp
		Burrowing Owl
		Spotted Owl
		Western Screech-Owl - *macfarlanei* ssp
		Short-eared Owl
	GROUSE	Sharp-tailed Grouse
		White-tailed Ptarmigan
	WOODPECKERS	Hairy Woodpecker - *picoideus* ssp
		Lewis's Woodpecker
		White-headed Woodpecker
		Williamson's Sapsucker - *nataliae* ssp. and *thyroideus* ssp
REPTILES		Gopher Snake - *deserticola* ssp
		Gopher Snake -*catenifer* ssp
		Night Snake
		Painted Turtle
		Racer
		Sharptail Snake
		Western rattlesnake
AMPHIBIANS		Coeur d'Alene Salamander
		Northern Leopard Frog
		Great Basin Spadefoot
		Pacific Giant Salamander
		Tiger Salamander
		Tailed Frog (Coastal and Inland)
WILDLIFE HABITAT		Sensitive Wetlands
		Coarse Woody Debris
		Ungulate Winter Ranges
PLANT COMMUNITIES		Red-listed Plant Communities
		Riparian Ecosystems
		Alpine and Subalpine Meadows

Interim Wildlife Guidelines for Commercial Backcountry Recreation in British Columbia

Chapter 2

AMPHIBIANS & REPTILES



Northwest Toad
Photo: BC Parks

BRITISH COLUMBIA
Ministry of Water, Land and Air Protection
May, 2002

Biodiversity Branch
Ecosystem Planning and Standards Section
Email: Ecosystem.Planning@gems3.gov.bc.ca

TABLE OF CONTENTS

General Guidelines for All Species	2
Coeur d'Alene Salamander	4
Gopher Snake - deserticola ssp.	12
Gopher Snake -catenifer ssp	12
Great Basin Spadefoot	16
Night Snake	12
Northern Leopard Frog	6
Pacific Giant Salamander	14
Painted Turtle	10
Racer	12
Sharptail Snake	12
Snakes: Red- and Blue-listed species	12
Tailed Frog	8
Tiger Salamander	18
Western Rattlesnake	12

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

General Guidelines for All Species

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect wildlife from human disturbance	1.1	Within tenures, place new developments within or immediately adjacent to existing developments or facilities so that human impacts are clustered	1.1.1	No human caused disturbance
		1.2	Avoid noisy, intrusive, or otherwise potentially harassing human activities during periods of the year when wildlife are under severe environmental and physiological stress, in particular during the winter survival and spring natality periods. Direct and deliberate harassment is never acceptable.	1.2.1	No human caused disturbance
		1.3	Humans should not feed or approach wildlife closer than 20 m, even habituated individu	1.3.1	No human caused disturbance
		1.4	Control livestock and pets to minimize harassment and displacement of wildlife		
		1.5	Train staff and clients to increase awareness on appropriate behaviour in wilderness settings to minimize potential for human disturbance	1.4.1	Knowledgeable staff and clients ensure minimal disturbance
2.0	Maintain wildlife habitat values	2.1	Carefully consider future and existing activities to avoid disturbing or removing important habitats. Be aware of potential implications such as alteration of animal movement patterns, displacement of animals from key habitats, and destruction of homesites and other habitat features.	2.1.1	Wildlife habitat values maintained
		2.2	Minimize the use of pesticides and herbicides and other chemicals that may contaminate the environment and impair healthy ecosystem functions	2.2.1	No ecosystem contamination
3.0	Improve mitigation guidelines	3.1	Initiate wildlife monitoring programs, under the direction of a professional biologist, and with the approval of WLAP's wildlife program, to modify guidelines to be more area and user specific	3.1.1	Guidelines modified and improved to reflect local circumstances

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

GENERAL GUIDELINES FOR ALL SPECIES

The objective of commercial recreation guidelines for all species is to maintain current distribution and abundance of wildlife resources within the project area.:

Information on seasonal habitat use, migration routes, natality areas, and timing of animal activities is important to effectively mitigate impacts of commercial recreation on wildlife populations. User initiated wildlife monitoring programs, under the direction of a professional biologist, and with the approval of WLAP's Environmental Stewardship Branch, could be used to modify guidelines to be more area and user specific

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Coeur d'Alene Salamander (Blue)

Last revision: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations of Coeur d' Alene Salamander	1.1[M]	Identify and map breeding and foraging Coeur d'Alene Salamander habitats	1.1.1	Map of Coeur d' Alene Salamander areas provided
2.0	Maintain riparian habitat including waterfall splash zones	2.1	Prevent facility development within 500 m of breeding and foraging habitats	2.1.1	Natural conditions maintained
		2.2	Prevent road construction within 100 m of breeding and foraging habitats		
		2.3	No trail construction within 50 m of breeding and foraging habitat		
3.0	Protect the population from toxic substances .	3.1	Prevent the use of pesticides and herbicides in the vicinity of breeding or foraging habitats, and minimize the use of other chemicals that may contaminate the environment and impair healthy ecosystem functions.	3.1.1	No pesticide or herbicide use in known use areas
4.0	Protect the population from harassment by humans	4.1	Train staff and clients in appropriate behaviour in the vicinity of Coeur d'Alene salamanders and their habitats.	4.1.1	No harassment by humans

[M] = Strategy required for major development only

Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Coeur d'Alene Salamander

Key issues of concern: breeding habitat, wintering areas.

Principal sources of information

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). Rare amphibians, reptiles, and mammals of British Columbia. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks.

For distribution and map, see:
http://wlapwww.gov.bc.ca/wld/documents/AAAAD12270.pdf

The Coeur d'Alene Salamander is a blue-listed species in British Columbia that occurs as small, disjunct populations in southeastern B.C. Its habitat requirements include wet areas, such as wet seeps, waterfall splash zones and streamside riparian zones. As well, this salamander requires rock formations with deep clefts that provide protection from hot dry temperatures in summer, and freezing temperatures in winter.

Activities that affect water quality and riparian habitats can be deleterious to this species. Thus recreational activities that modify water quality (e.g., improper treatment of liquid wastes), and habitat composition (e.g., trail construction and campsites), expose this species to additional risks. This sensitivity is exacerbated by their fragmented population structure: small, isolated populations are more prone to extinction than larger populations, and re-colonization of extirpated populations is problematic.

The objective of commercial recreation guidelines for the Coeur d'Alene Salamander* is to maintain their current distribution and abundance within the province.

* Location information on this species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Northern Leopard Frog (Red)

Last modified March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations of leopard frogs	1.1M	Identify and map breeding, overwintering, migratory and foraging habitats of leopard frog	1.1.1	Map of leopard frog areas provided
2.0	Maintain riparian habitat and wetlands	2.1	Maintain important habitat values by preventing alteration of breeding and foraging habitats.	2.1.1	Natural habitat maintained
3.0	Maintain natural populations of leopard frogs	3.1	No introduction of predatory fish into aquatic systems that support leopard frogs	3.1.1	No unnatural predation
4.0	Protect the population from toxic substances	4.1	Prevent the use of pesticides and herbicides in the vicinity of breeding or foraging habitats, and minimize the use of other chemicals that may contaminate the environment and impair healthy ecosystem functions.	4.1.1	No pesticide use in known use areas
5.0	Protect the population from harassment by humans	5.1	Train staff and clients in appropriate behaviour in the vicinity of northern leopard frogs and their habitats.	5.1.1	No harassment by humans
6.0	Protect tadpole rearing areas	6.1	Ensure livestock do not enter riparian areas near breeding and tadpole rearing habitats	6.1.1	No interference with tadpole rearing

[M] = Strategy required for major development only

Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Northern Leopard Frog

Key issues of concern: wetlands

Principal sources of information:

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia.* Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications http://www.crownpub.bc.ca/ Inventory Number 605.

For distribution and map, see:

http://wlapwww.gov.bc.ca/wld/documents/AAABH01170.pdf

Historically, this species occurred in the Okanagan Valley and in the East Kootenays. Northern leopard frogs have disappeared from all previously known locations, and presently occur only in the Creston Valley Wildlife Management Area. Given that this is a protected area, there is little concern about the impacts of backcountry recreation. However, previously occupied habitat should not be overlooked as it provides the areas for this species to become re-established, whether by natural processes or by human intervention.

The objective of commercial recreation guidelines for the Northern Leopard Frog* is to maintain their current distribution and abundance within the province.

* Location information on this species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Tailed Frog

Coastal Tailed Frog (Blue), Inland (Rocky Mountain) Tailed Frog (Red)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations of Tailed Frogs	1.1[M]	Identify and map breeding and foraging Tailed Frog habitats	1.1.1	Map of Tailed Frog areas provided
2.0	Retain functioning riparian areas around critical habitats	2.1	Avoid creating new access to breeding and foraging habitats	2.2.1	No new accesses
		2.2	Maintain stream channel integrity, groundwater flow, substrate composition, forest cover and natural temperature regimes.	2.2.2	No change in habitat value
3.0	Minimize tailed frog disturbance	3.1	Prevent the introduction of fish into stream reaches supporting tailed frogs	3.1.1	No new species present
		3.2	Train staff and clients in appropriate behaviour in the vicinity of tailed frogs and their habitats.	3.2.1	No harassment by humans
		3.3	Prevent the use of pesticides and herbicides in the vicinity of breeding or foraging habitats, and minimize the use of other chemicals that may contaminate the environment and impair healthy ecosystem functions.	3.3.1	Absence of pesticide related mortality
4.0	Maintain adequate stream flow	4.1	Do not undertake significant upstream diversions	4.1.1	Normal stream flows
5.0	Maintain water quality	5.1	Prevent earthworks and avoid road development on unstable soils near breeding and foraging habitat	5.1.1	Absence of new siltation in critical habitat

[M] = Strategy required for major development only

Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Tailed Frog

Key issues of concern: breeding streams, water quality and stream stability

Principal sources of information:

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/) for $26.00, Inventory Number 605.

Dupuis, L. (1998). *Tailed frog* (Wildlife in British Columbia At Risk). Victoria, BC: Ministry of Environment, Lands and Parks. Available at http://wlapwww.gov.bc.ca/wld/

For distribution and map, see:

http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-02.htm

http://wlapwww.gov.bc.ca/wld/documents/AAABA01020.pdf

Tailed frogs occur in the Coast and Cascade Mountain Ranges of western British Columbia, and in two drainages in the extreme southeastern corner of the province. These two species lives in cool, permanent mountain streams with stable substrates and narrow temperature regimes.

Activities that damage the integrity of streams will adversely affect tailed frogs. Actions that damage riparian vegetation and in-stream activities can increase sediment loads, increase water temperatures and de-stabilize stream channels – all of these are inimical to the well-being of this species.

The objective of commercial recreation guidelines for the Tailed Frog* is to maintain their current distribution and abundance within the province.

* Location information on this species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Painted Turtle (Blue)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations of Painted Turtles	1.1[M]	Identify and map nesting, overwintering and foraging sites	1.1.1	Map of Painted Turtle areas provided
2.0	Maintain riparian habitat and wetlands	2.1	Prevent road, trail and facility development within 250 m of key nesting, overwintering and foraging sites	2.1.1	Natural habitat maintained
		2.2	New water impoundments that would flood important habitats should not be constructed		
3.0	Maintain natural movement corridors	3.1	Avoid road development near nesting and foraging habitats and movement routes	3.1.1	No disruption of natural movements
4.0	Protect from abuse'(Note: this turtle is popular with collectors)	4.1	Train staff and clients in appropriate behaviour in the vicinity of Painted Turtles and their habitats.	4.1.1	Number of incidents

[M] = Strategy required for major development only

Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Painted Turtle

Key issues of concern: nesting and hibernation habitats, movement corridors

Principal sources of information:

Blood, D. A., & Macartney, M. (1998). *Painted turtle* (Wildlife in British Columbia At Risk). Victoria, BC: Ministry of Environment, Lands and Parks. Available at

http://wlapwww.gov.bc.ca/wld/documents/pturtle.pdf

Joslin, G., & Youmans, H. (1999). *Effects of recreation on Rocky Mountain Wildlife: A review for Montana*: Committee on Effects of Recreation on Wildlife. Montana Chapter of The Wildlife Society.

The painted turtle is widespread in southeastern North America, but is restricted to valleys and lowlands across southern BC, from Vancouver Island to the East Kootenay, and north to Williams Lake. The species lays eggs in May or June in a nest dug in sandy-gravelly soils near water. Individuals often move between summer and winter hibernating ponds. Turtles hibernate in bottom mud of lakes and ponds and emerge with warming water temperatures.

Where motorized vehicles bisect travel corridors used by painted turtles between their summer and winter habitats, there is a risk that animals will be crushed. As well, activities that impact water quality of both summer and winter waterbodies will adversely affect turtles.

The objective of commercial recreation guidelines for the Painted Turtle* is to maintain their current distribution and abundance within the province.

* Location information on this species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Snakes: Red- and Blue-listed species

Gopher Snake -*catenifer* ssp.(RED), Gopher Snake - *deserticola* ssp. (BLUE), Night Snake (RED), Racer (BLUE), Sharptail Snake (RED), Western Rattlesnake (BLUE)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations of red- and blue-listed snakes	1.1[M]	Identify and map denning, nesting and important foraging habitats	1.1.1	Presence of maps
2.0	Protect denning areas	2.1	Prevent facility development within 250 m of known den sites	2.1.1	Persistence of den sites
		2.2	Avoid road and trail development within 100 m of denning areas	2.2.1	Lack of gopher snake mortality
3.0	Maintain habitat	3.1	Protect critical structural elements such as wildlife trees, coarse woody debris, rock outcrops and riparian areas outside identified development area	3.1.1	Presence of critical structural elements.
		3.2	Avoid livestock grazing within 100 m of known den sites. Do not use identified areas for hay cutting. No prescribed burning on identified areas.	3.2.1	Absence of identified activities
4.0	Protect from physical abuse (Note: some snakes may be mistaken for rattlesnakes)	4.1	Train staff and clients in appropriate behaviour in the vicinity of snakes and their habitats. Prevent disturbance of dens when viewing snakes.	4.1.1	Number of interactions
		4.2	Minimize rock climbing activities in known snake areas	4.2.1	Number of interactions

[M] = Strategy required for major development only

Note: Information on these species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Snakes: Red- and Blue-listed species

Racer (BLUE), Sharptail Snake (RED), Night Snake (RED), Gopher Snake -*catenifer* ssp.(RED), Gopher Snake - *deserticola* ssp. (BLUE), and Western Rattlesnake (BLUE)

Key issues of concern: hibernacula/winter den sites, movement corridors

Principal sources of information:

Blood, D. A. (1993). *Western rattlesnake* (Wildlife in British Columbia At Risk). Victoria, BC: Ministry of Environment, Lands and Parks. Available at http://wlapwww.gov.bc.ca/wld/

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/) for $26.00, Inventory Number 605

For distribution and map of Gopher Snake- deserticola, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-03.htm

For distribution and map of Night Snake, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-04.htm

For distribution and map of Rubber Boa, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-05.htm

All three red-listed snakes Sharptail Snake, Night Snake, and Gopher Snake -*catenifer* ssp. occur in and near settlements and so are unlikely to be impacted by backcountry recreation. The *catenifer* Gopher Snake appears to have been extirpated from BC.

There are three blue-listed snakes: Racer, Western Rattlesnake and Gopher snake (ssp. *deserticola*). All of these snakes occur in the southern interior of the Province, although their individual distributions vary somewhat. All of these snakes den in winter hibernacula, sometimes with other species. They emerge in May and disperse to summer feeding areas. These wintering sites are critical for these snakes to cope with cold winter temperatures, and so precautions are required to prevent damage to hibernacula. As well, it is important to minimize disturbance to emerging snakes.

The objective of commercial recreation guidelines for the Red- and Blue-listed snakes* is to maintain their current distribution and abundance within the province.

* Location information on several of these species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Pacific Giant Salamander (Red)

Last modified: May 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations of Pacific Giant Salamanders	1.1[M]	Identify and map breeding and foraging Pacific Giant Salamander habitats	1.1.1	Map of Pacific Giant Salamander areas provided
2.0	Retain functioning riparian areas around critical habitats	2.1	Avoid creating new access to breeding and foraging habitats	2.2.1	No new accesses
		2.2	Maintain stream channel integrity, groundwater flow, substrate composition, forest cover and natural temperature regimes.	2.2.2	No change in habitat value
3.0	Minimize Pacific Giant Salamander disturbance	3.1	Prevent the introduction of fish into stream reaches supporting Pacific Giant Salamanders	3.1.1	No new species present
		3.2	Train staff and clients in appropriate behaviour in the vicinity of Pacific Giant Salamanders and their habitats.	3.2.1	No harassment by humans
		3.3	Prevent the use of pesticides and herbicides in the vicinity of breeding or foraging habitats, and minimize the use of other chemicals that may contaminate the environment and impair healthy ecosystem functions.	3.3.1	Absence of chemical- related mortality
4.0	Maintain adequate stream flow	4.1	Do not undertake significant upstream diversions	4.1.1	Normal stream flows
5.0	Maintain water quality	5.1	Prevent earthworks and avoid road development on unstable soils near breeding and foraging habitat	5.1.1	Absence of new siltation in critical habitat

[M] = Strategy required for major development only

Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Pacific Giant Salamander

Principal sources of information:

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 605.

For distribution and map, see:
http://wlapwww.gov.bc.ca/wld/documents/AAAAH01040.pdf

Pacific Giant Salamanders are species that live in and around the cold mountain streams of the Fraser Valley. The larvae hide under rocks, debris, and overhanging streambanks. Little is known of the ecology of adults but they presumably spend most of their time within the moss-covered soil of wet forests, where they eat invertebrates such as beetles, spiders, and slugs but can capture vertebrate prey as large as shrews, mice, and smaller salamanders. The adults are largely sedentary, but on wet nights they can move several hundred metres, and often move 1500 m on successive nights. The adult females lay 85–200 eggs, singly or in clumps, in a hidden subterranean or underwater nest site, and protect the eggs for up to 7 months.

The objective of commercial recreation guidelines for the Pacific Giant Salamanders * is to maintain their current distribution and abundance within the province.

* Location information on this species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Great Basin Spadefoot (Blue)

Last modified: May 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations of Great Basin Spadefoots	1.1[M]	Identify and map breeding and foraging Great Basin Spadefoot Toad habitats	1.1.1	Map of Great Basin Spadefoot Toad areas provided
2.0	Minimize habitat disturbance	2.1	Locate any facilities outside riparian zones containing Great Basin Spadefoots	2.1.1	Small ecological footprint of development
		2.2	Avoid road development and limit trail development in riparian zone containing Great Basin Spadefoot Toad.	2.2.1	Km of roads and trails in grasslands and riparian areasn
		2.3	Train staff and clients on responsible behaviour near Great Basin Spadefoot habitat in grasslands and riparian zones	2.3.1	
		2.4	Prohibit vehicle use in identified Great Basin Spadefoot habitat during breeding season, from mid- April to late July	2.4.1	No vehicle damage to breeding populations
		2.5	No introduction of predatory fish to Great Basin Spadefoot habitat	2.5.1	Native fauna maintained
		2.6	Prevent the use of pesticides and herbicides in the vicinity of breeding or foraging habitats, and minimize the use of other chemicals that may contaminate the environment and impair healthy ecosystem functions.	2.6.1	Absence of chemical- related mortality

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Great Basin Spadefoot

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca , Inventory Number 605.

For distribution and map, see:
http://wlapwww.gov.bc.ca/wld/documents/AAABF02030.pdf

Great Basin Spadefoots are amphibians primarily of sagebrush flats, dry grasslands, semi-desert shrublands and open woodlands with sandy soil. They typically breed in shallow ponds or temporary pools that dry up by early to mid-summer.

In British Columbia, most sites are in the low-elevation Bunchgrass Zone, but there are records of tadpoles in three lakes in the Englemann Spruce-Subalpine Fir Zone within a few hundred metres of steep, south-facing grasslands in the Montane Spruce Zone.

The larvae are scavengers on algae, aquatic plants, dead fish, and even their own feces. Adults forage at night, eating a variety of terrestrial invertebrates, and are themselves preyed upon by snakes, Great Blue Herons, and Coyotes.

Breeding begins in mid- to late April, and can occur as late as July, especially in wet, cool years. Females lay 300–800 eggs in smaller clusters attached to sticks, pebbles, or aquatic vegetation. The larval development time is 6–8 weeks.

Commercial recreation concerns for this species is the encroachment upon the areas around small ponds and temporary pools in the dry southern interior of the province during breeding season and afterwards while the adults forage. Once the adults again burrow into the soil, the threats to individuals are reduced.

The objective of commercial recreation guidelines for theGreat Basin Spadefoot Toad is to maintain their current distribution and abundance within the province.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Tiger Salamander (Red)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations of Tiger Salamanders	1.1[M]	Identify and map breeding and foraging Tiger Salamander habitats	1.1.1	Map of Tiger Salamander areas provided
1.0	Minimize habitat disturbance	1.1	Locate any facilities more than 150 m outside ponds and riparian zones containing Tiger Salamanders	1.1.1	Small ecological footprint of development
		1.2	Avoid road development and limit trail development in riparian zone containing Tiger Salamander.	1.2.1	Km of roads and trails in grasslands and riparian areasn
		1.3	Train staff and clients on responsible behaviour near Tiger Salamander habitat in grasslands and riparian zones	1.3.1	
		1.4	Prohibit vehicle use within 150 m of ponds in identified as Tiger Salamander habitat	1.4.1	No vehicle damage to breeding populations
		1.5	No introduction of predatory fish to Tiger Salamander habitat	1.5.1	Native fauna maintained
		1.6	Prevent the use of pesticides and herbicides in the vicinity of breeding or foraging habitats, and minimize the use of other chemicals that may contaminate the environment and impair healthy ecosystem functions.	1.6.1	Absence of chemical- related mortality

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Amphibians and Reptiles**

Tiger Salamander

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 605.

The Tiger Salamander is widespread throughout North America, but found in British Columbia only in the southern Okanagan and Similakmeen areas. Its main habitats in areas with lakes, ponds or seasonal pools within the dry bunchgrass and ponderosa pine environments. They typically breed in warm shallow ponds or temporary pools that may dry up by early to mid-summer. Eggs are laid in April or May/

Commercial recreation concern for this species is the encroachment upon the areas around small ponds and temporary pools during breeding season and afterwards while the adults forage. Adult salamanders do not range much beyond 150 m from their home pond.

50% of the original breeding habitat of the Tiger Salamander has been lost, due to habitat degradation and fish stocking programs. Introduced fish in Tiger Salamander habitat is a major cause of endangerment of this species.

The objective of commercial recreation guidelines for theTiger Salamander is to maintain their current distribution and abundance within the province.

Interim Wildlife Guidelines for Commercial Backcountry Recreation in British Columbia

Chapter 3

BIRDS

Pigeon Guillemots
Photo: Mike McGrenere

BRITISH COLUMBIA

Ministry of Water, Land and Air Protection
May, 2002

Biodiversity Branch
Ecosystem Planning and Standards Section
Email: Ecosystem.Planning@gems3.gov.bc.ca

BIRD SPECIES	Page
American Avocet	10
American Bittern	8
American Golden-Plover	10
American White Pelican	34
Ancient Murrelet	14
Bald Eagle	16
Bay-breasted Warbler	26
Black-throated Green Warbler	26
Bobolink	26
Brandt's Cormorant	14
Brewer's Sparrow -breweri ssp.	26
Broad-winged Hawk	20
Burrowing Owl	24
Canada Warbler	26
Canyon Wren	26
Cape May Warbler	26
Cassin's Auklet	14
Common Murre	14
Connecticut Warbler	26
Double-crested Cormorant	14
Ferruginous Hawk	20
Flammulated Owl	22
Grasshopper Sparrow	26
Gray Flycatcher	26
Great Blue Heron	4
Green Heron	8
Gyrfalcon	18
Hairy Woodpecker - picoideus ssp	40
Harlequin Duck	36
Horned Puffin	14
Hudsonian Godwit	10
Lark Sparrow	26
Lewis's Woodpecker	40
Long-billed Curlew	10
Marbled Murrelet	6
Nelson's Sharp-tailed Sparrow	26
Northern Goshawk-laingi subspecies*	20
Northern Pygmy-Owl- swarthi ssp.	22
Northern Saw-whet Owl- brooksi ssp.	22
Pelagic Cormorant - pelagicus ssp.	14
Peregrine Falcon - anatum ssp.- pealei ssp.	18
Philadelphia Vireo	26
Pine Grosbeak -carlottae ssp.	26
Prairie Falcon	18
Purple Martin	26
Red-necked Phalarope	10
Sage Thrasher	26
Sandhill Crane	12
Sharp-tailed Grouse – columbianus ssp.	30
Short-billed Dowitcher	10
Short-eared Owl	24
Smith's Longspur	26
Spotted Owl	22
Steller's Jay -carlottae ssp.	26
Swainson's Hawk*	20
Thick-billed Murre	14
Tufted Puffin	14
Upland Sandpiper	10
Vesper Sparrow -affinis ssp.	26
Wandering Tattler	10
Western Grebe	38
Western Screech-Owl - macfarlanei ssp.	22
White-headed Woodpecker	40
White-tailed Ptarmigan- saxatalis spp.	32
White-throated Swift	28
Williamson's Sapsucker - nataliae ssp.	40
Williamson's Sapsucker - thyroideus ssp.	40
Yellow-breasted Chat	26

ACTIVITY	AFFECTED WILDLIFE	Page
Boating	Western Grebe	38
Hang-gliding	Cliff-nesting Raptors	18
	Swifts	28
Hiking	Burrow-nesting Seabirds	14
	Cliff-, Rock-, and Ground-nesting Seabirds	14
	Great Blue Heron Colonies	4
Hiking with Dogs	Winter-roosting Harlequin Ducks	36
Kayaking	Cliff-, Rock-, and Ground-nesting Seabirds	14
Off Highway Vehicle	Great Blue Heron Colonies	4
	Tree-nesting Raptors	20
River Rafting	Harlequin Duck – breeding	36
Rock Climbing	Cliff-nesting Raptors	18
	Swifts	28

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

General Guidelines for All Species

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect wildlife from human disturbance	1.1	Within tenures, place new developments within or immediately adjacent to existing developments or facilities so that human impacts are clustered	1.1.1	No human caused disturbance
		1.2	Avoid noisy, intrusive, or otherwise potentially harassing human activities during periods of the year when wildlife are under severe environmental and physiological stress, in particular during the winter survival and spring natality periods. Direct and deliberate harassment is never acceptable.	1.2.1	No human caused disturbance
		1.3	Humans should not feed or approach wildlife closer than 20 m, even habituated individuals	1.3.1	No human caused disturbance
		1.4	Control livestock and pets to minimize harassment and displacement of wildlife		Reduced killing of wildlife to protect domestic animals
		1.5	Train staff and clients to increase awareness on appropriate behaviour in wilderness settings to minimize potential for human disturbance	1.4.1	Knowledgeable staff and clients ensure minimal disturbance
2.0	Maintain wildlife habitat values	2.1	Carefully consider future and existing activities to avoid disturbing or removing important habitats. Be aware of potential implications such as alteration of animal movement patterns, displacement of animals from key habitats, and destruction of homesites and other habitat features.	2.1.1	Wildlife habitat values maintained
		2.2	Minimize the use of pesticides and herbicides and other chemicals that may contaminate the environment and impair healthy ecosystem functions	2.2.1	No ecosystem contamination
3.0	Improve mitigation guidelines	3.1	Initiate wildlife monitoring programs, under the direction of a professional biologist, and with the approval of WLAP's wildlife program, to modify guidelines to be more area and user specific	3.1.1	Guidelines modified and improved to reflect local circumstances

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

GENERAL GUIDELINES FOR ALL SPECIES

The objective of commercial recreation guidelines for all species is to maintain current distribution and abundance of wildlife resources within the project area..

Information on seasonal habitat use, migration routes, natality areas, and timing of animal activities is important to effectively mitigate impacts of commercial recreation on wildlife populations. User initiated wildlife monitoring programs, under the direction of a professional biologist, and with the approval of WLAP's Environmental Stewardship Branch, could be used to modify guidelines to be more area and user specific

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Gulls, Waders and Fish-eating Birds: Great Blue Heron* (*Blue*)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain use of existing heronries	1.1	Avoid development of facilities within 250 m of an occupied heronry	1.1.1	Sustained heronry use
2.0	Avoid human caused disturbances	2.1	Train staff and clients in appropriate behaviour in the vicinity of Great Blue Herons and their habitats.	2.1.1	Sustained heronry use
		2.2	Limit helicopter and fixed-wing over-flight altitude to a minimum of 500m over active heronries. Prevent helicopter landings near active heronries	2.2.1	Sustained heronry use
		2.3	Prevent disturbance of nest trees and nesting habitats in both occupied and unoccupied heronries.		
		2.4	Prevent observers, particularly with dogs, from walking under active heronries		
3.0	Protect foraging sites	3.1	Document important foraging areas and avoid intensive use in these areas	3.1.1	Continued foraging
4.0	Protect the species from toxic substances	4.1	Avoid the use of pesticides, including herbicides in breeding/foraging habitats	4.1.1	No toxic effects due to pesticides

[M] = Strategy required for major development only

* Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

Great Blue Heron

Key issues of concern: rookeries, winter roost sites, and foraging habitats

Principal sources of information:
Butler, R. W. (1997). *The Great Blue Heron: a natural history and ecology of a seashore sentinel.* Vancouver, BC: UBC Press.

Great Blue Herons are a colonial-nesting species that forages primarily in freshwater and marine environments, especially along margins and shorelines. They are year-round residents over most of the southern half of B.C. The nest structures of Great Blue Herons are protected year-round, whether they are active or not, under Section 34 of the British Columbia Wildlife Act.

Heron colonies occur in treetops in numbers that range from a few to more than 150. The location of colonies shift, but the presence of suitable trees in proximity to foraging habitat is a key requirement. A key concern for herons is the need to minimize disturbance of nesting birds.

The objective of commercial recreation guidelines for the Great Blue Heron is to maintain the current distribution and abundance of their populations in the province.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Gulls, Waders and Fish-eating Birds: Marbled Murrelet (Red)*

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain nesting habitat	1.1	Identify and map nesting areas	1.1.1	Nesting habitat identified
2.0	Protect the species	2.1	Document and report all nesting occurrences of Marbled Murrelets	2.1.1	Known nesting occurrences documented
3.0	Avoid harassment of nesting birds	3.1	Prevent facility development within 2000 m of nest areas.	3.1.1	Habitat maintained and no pests introduced to nesting colonies
		3.2	Maintain a no human or pet contact buffer zone of 500 m around nest areas from May to August	3.2.1	Breeding birds are not harassed
		3.4	Train staff and clients in appropriate behaviour in the vicinity of Marbled Murrelets and their habitats	3.4.1	Knowledgeable staff ensure no intrusions

* Note: Information on these species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Marbled Murrelet

Principal sources of information:

Environment Canada. 2002. *Seabirds: An indicator of marine ecosystem status for coastal British Columbia.*

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia.* Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-19.htm

The British Columbia coastline supports large populations of breeding seabirds. Biologists estimate that there are more than 30,000 Marbled Murrelets nesting on our coast.

A wide variety of factors can affect seabird populations including changes in key prey species, oil spills, toxic contaminants, overfishing, gillnet bycatch, predation and climatic conditions. As Marbled Murrelets nest in tall, old-growth trees, the major risk from commercial recreation is likely to be noise disturbance through aircraft and human activity on the ground.

The objective of commercial recreation guidelines for Marbled Murrelets is to maintain the current distribution and abundance of their populations in the province.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Gulls, Waders and Fish-eating Birds: Red- and Blue-listed Marshbirds

American Bittern (BLUE), Green Heron (BLUE)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations	1.1[M]	Identify critical nesting habitat and develop plans to avoid disturbance	1.1.1	Critical habitat maintained
		1.2	Document and report any known species nesting/breeding locations	1.2.1	Species nesting/breeding locations noted and reported
2.0	Maintain habitat	2.1	Prevent in-filling of marsh habitats and maintain natural cover around nesting wetlands	2.1.1	Cover maintained
		2.2	Prevent alteration of natural water regimes (dams and diversions)	2.2.1	Natural water levels maintained
		2.3	Avoid the use of pesticides/herbicides in the vicinity of nesting or foraging areas	2.3.1	No pesticides used in vicinity
3.0	Avoid harassment of nesting birds	3.1	Maintain a no motorized watercraft buffer zone of 250 m around nest areas from April to August	3.1.1	No disruption during nesting period
		3.2	Maintain a no human or pet contact buffer zone of 250 m around nest areas from April to September	3.2.1	No disruption during breeding season
		3.3	Staff and client training to ensure non-intrusive viewing	3.3.1	No disruption during breeding season

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Red- and Blue-listed Marshbirds

American Bittern (BLUE) and Green Heron (BLUE)

Principal source of information:

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 600.

American Bittern

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-09.htm

In BC, American Bitterns usually breed in wet areas with dense growths of tall emergent vegetation or tall grasses adjacent to freshwater sloughs, marshes, swamps, and shallow, protected sections of lakes between sea level and 1300 m elevation in the south and central interior and in the lower Fraser Valley. American Bitterns normally nest as solitary pairs. The typical nest is a well-concealed platform of reeds, cattails, or sedges, in stands of cattail and bulrush, over water 5–20 cm deep. Dry fields and marshes are occasionally used for nesting. They forage primarily in marshes, but also sloughs, lake edges, swamps, river banks, sewage ponds, and fields breeding. Their habitats are threatened by development in the southern part of the province. Undiscovered breeding sites likely exist further north in lowland river valleys (e.g., Skeena, Nechako, and Peace River drainages).

Green Heron

In British Columbia, Green Heron breeding habitat consists of small ponds, sloughs, lakes, slow-moving rivers, and marshy areas, typically sheltered by thickets of willow or alder, between sea level and 610 m elevation. Green Herons normally nest as solitary pairs, but occasionally in small colonies. The nest is a platform of sticks and twigs, placed near the end of branches between 4 m and 35 m up in a tree or tall shrub. In British Columbia, nest sites may be as much as 1 km from water.

The Green Heron is moderately threatened because its British Columbia range overlaps that of a dense and rapidly growing human population in the Georgia Depression. Although urbanization and industrialization threatens lowland wetlands in general, this species seems quite resilient and tolerant of a certain level of human disturbance. Threats to habitat are somewhat mitigated by the Green Heron's ability to breed in relatively small habitat patches and to colonize new sites readily. In addition, British Columbia birds can nest at considerable distance (up to 1 km) from permanent water sources.

The objective of commercial recreation guidelines for the Red- and Blue-listed marshbirds is to maintain the current distribution and abundance of their populations in the province.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Gulls, Waders and Fish-eating Birds: Red- and Blue-listed Shorebirds

American Avocet (RED), American Golden-Plover (BLUE), Hudsonian Godwit (RED), Long-billed Curlew (BLUE), Red-necked Phalarope (BLUE), Short-billed Dowitcher (BLUE), Upland Sandpiper (RED), Wandering Tattler (BLUE)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations	1.0[M]	For major developments, identify and map nest areas	1.1.1	Habitat areas mapped
2.0	Maintain habitat	2.1	Prevent in-filling, draining and flooding of marsh and wetland habitats and maintain natural cover around nesting wetlands	2.1.1	Cover maintained
		2.2	When detrimental, minimize livestock grazing in occupied habitat	2.3	Habitat maintained
3.0	Avoid harassment of nesting birds	3.1	Prevent humans from approaching within 100 m of nesting habitats May to August	3.1.1	Successful nesting
		3.2	Train staff and clients in appropriate behaviour in the vicinity of shorebirds and their habitats.	3.2.1	No harassment
		3.3	Do not allow dogs within 250 m of nesting habitats from May to August and ensure dogs are leashed		
4.0	Protect red and blue-listed shorebirds from toxic substances	4.1	Avoid the use of pesticides, including herbicides in breeding/foraging habitats	4.1.1	No toxic effects due to pesticides

[M] = Strategy required for major development only

* Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened

Red- and Blue-listed Shorebirds

American Avocet
American Avocets usually nest along the shores and flats of sparsely vegetated lakes and sloughs, particularly alkaline ones such as Alki Lake, the major breeding site in British Columbia. Avocets are known to have bred at Duck Lake near Creston, Beresford Lake near Kamloops, Serpentine Fen near Surrey), Little White Lake near Clinton, and Alki Lake near Kelowna. Most of these sites are ephemeral, and were only in use for one year. Alki Lake is the exception, being both the major breeding site in British Columbia, and the only site believed to have been in regular use since at least 1987. Apparently suitable habitats are scattered throughout the south-central interior suggesting other breeding sites remain to be discovered.

Coastal habitats used in migration include mudflats, estuaries, small ponds, spits and sparsely vegetated muddy shorelines. Interior habitats used in migration include lowland marshes, shallow alkaline ponds, shores of larger lakes, and sewage lagoons.

The objective of commercial recreation guidelines for the American Avocet is to maintain the current distribution and abundance of their populations in the province. The following additional commercial recreation guidelines apply to all populations of American Avocet:
Prevent in filling, draining, or flooding of marsh and wetland habitats used by American Avocets.

Long-billed Curlew
For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-12.htm

The objective of commercial recreation guidelines for the Long-billed Curlew is to maintain the current distribution and abundance of their populations in the province. The following additional commercial recreation guidelines apply to all populations of Long-billed Curlew:
A. Maintain native bunchgrass vegetation and prevent prescribed burning in designated nesting areas.

Upland Sandpiper
Typical habitat of the Upland Sandpiper is open grassy uplands, hayfields, pastures, prairies. In British Columbia, it is known from lush overgrown fallow fields in the Peace River lowlands and large, natural grasslands near woodland borders in the Chilcotin-Cariboo and South Okanagan.

Upland Sandpipers nest in a grass-lined depression in the ground, well hidden among grass or other low vegetation. They require undisturbed grasslands and old-fields for breeding habitat. Habitats in the Peace River lowlands are very patchy and vulnerable to agricultural activities. Habitats in the Cariboo-Chilcotin are susceptible to overgrazing and trampling by livestock and in some areas, forest encroachment into grasslands. Any potential habitats left in the Okanagan are at risk due to rapid urban and agricultural development.

The objective of commercial recreation guidelines for the Upland Sandpiper is to maintain the current distribution and abundance of their populations in the province. The following additional commercial recreation guidelines apply to all populations of Upland Sandpiper:
A. Maintain native grassland habitats and prevent prescribed burning in designated nesting areas.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Gulls, Waders and Fish-eating Birds: Sandhill Crane (Blue)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect known breeding wetlands	1.1	Maintain structural integrity of identified riparian areas and minimum 50 m buffer	1.1.1	Habitat maintained
		1.2[M]	Identify and map nesting and foraging habitat	1.2.1	Habitat maintained
2.0	Avoid harassment	2.1	Staff and client training to ensure non-intrusive viewing	2.1.1	No intrusive behaviour or harassment
		2.2	Prevent motorized vehicles and dogs from approaching within 250 m of nesting areas	2.2.1	Nest sites not disturbed
		2.3	Prevent the use of motorized watercraft on identified lake and marsh areas during the breeding period and at major migration staging lakes/marshes	2.3.1	Nest sites not disturbed
		2.4	Maintain seasonal no-fly zones for helicopters and fixed-wing aircraft that are a minimum 2000 m horizontal and 500 m vertical distance from breeding colonies		

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Sandhill Crane

Principal source of information:

Blood, D. A., & Backhouse, F. (1999). *Sandhill Crane* (Wildlife in British Columbia At Risk). Victoria, BC: Ministry of Environment, Lands and Parks http://wlapwww.gov.bc.ca/wld/documents/sandhillcrane.pdf.

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 600.

For distribution and map, see:

http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-10.htm

Because of small population estimates and the continuing threats to their nesting habitat, the Sandhill Crane has been placed on the provincial Blue List. Sandhill Cranes receive protection against shooting and harassment under the federal Migratory Bird s Convention Act and the provincial Wildlife Act. Little of their known nesting habitat has been protected.

Three subspecies of Sandhill Crane occur in British Columbia – the Lesser Sandhill Crane (*Grus canadensis canadensis*), the Greater Sandhill Crane (*G. c. tabida*) and the Canadian Sandhill Crane (*G. c. rowani*). Information on the distribution and abundance of Sandhill Cranes that breed in the province is poor because they are very secretive when nesting and often choose remote habitats that are difficult to survey.

The Lesser Sandhill Crane breeds across the Northwest Territories, Yukon, Alaska and the northern reaches of the prairie provinces. Thousands migrate through British Columbia each spring and fall, travelling between their wintering grounds in the southern United States and their Arctic nesting sites. Most stay east of the Rocky Mountains, but a few travel through the Interior and along the Coast. A few cranes have been known to nest in the northeast corner of the province but their subspecific status is unknown.

The Greater Sandhill Crane is divided into four breeding populations. Members of one of these – the Central Valley population – nest in small groups in scattered locations across the southern half of B.C. Many of these areas are of great conservation concern.

Habitat loss and degradation is likely the greatest threat to Sandhill Cranes in British Columbia. Some former nesting sites on Vancouver Island and in the Fraser and Okanagan valleys have been disturbed or destroyed by drainage projects, agricultural and urban development, and logging activity. However, most of British Columbia's nesting cranes use remote areas that, to date , have not been subject to significant development or resource extraction.

Cranes face many natural hazards, including flooding of their nests and predation on eggs, chicks and the occasional adult. In addition, the growth of crane populations is very low due to their delayed sexual maturity and small clutch size. Even a small amount of additional mortality due to human activities can cause their numbers to decline.

The objective of commercial recreation guidelines for the Sandhill Crane is to maintain the current distribution and abundance of their populations in the province.

Gulls, Waders and Fish-eating Birds: Red- and Blue-listed Colonial Nesters*

Ancient Murrelet (BLUE), Brandt's Cormorant (RED), Cassin's Auklet (BLUE), Common Murre (RED) , Double-crested Cormorant (RED), Horned Puffin (RED), Pelagic Cormorant - *pelagicus* ssp.(RED), Thick-billed Murre (RED), Tufted Puffin (BLUE)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain nesting habitat	1.1	Identify and map nesting areas	1.1.1	Nesting habitat identified
2.0	Protect the species	2.1	Document and report all nesting occurrences of Red-listed seabirds	2.1.1	Known nesting occurrences documented
3.0	Avoid harassment of nesting birds	3.1	Prevent facility development within 2000 m of nest areas. In some cases, there should be no facility development or human activity on certain nesting islands where the consequence of introducing pests (e.g., rats and racoons) is particularly grave	3.1.1	Habitat maintained and no pests introduced to nesting colonies
		3.2	Maintain a no human or pet contact buffer zone of 500 m around nest areas from May to August	3.2.1	Breeding birds are not harassed
		3.3	Maintain a no motorized watercraft buffer zone of 500 m around nest areas from May to August	3.3.1	Breeding birds are not harassed
		3.4	Train staff and clients in appropriate behaviour in the vicinity of colonial-nesting seabirds and their habitats	3.4.1	Knowledgeable staff ensure no intrusions

* Note: Information on these species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Seabirds: Red-and Blue-listed colonial nesters

Brandt's Cormorant (RED), Pelagic Cormorant - *pelagicus* ssp.(RED), Double-crested Cormorant (RED), Common Murre (RED), Thick-billed Murre (RED), Ancient Murrelet (BLUE), Cassin's Auklet (BLUE), Horned Puffin (RED), and Tufted Puffin (BLUE)

Principal sources of information:

Environment Canada. 2002. *Seabirds: An indicator of marine ecosystem status for coastal British Columbia.*

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia.* Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks

For distribution and map of Ancient Murrelet, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-17.htm

For distribution and map of Cassin's Auklet, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-18.htm

For distribution and map of Marbled Murrelet, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-19.htm

The British Columbia coastline supports large populations of breeding seabirds. It is estimated that over 5.6 million breed at more than 500 locations along the coast. In the case of Ancient Murrelets, our 500,000 birds represent half of the world's population of this species, and half of that number nest on only four islands in Haida Gwaii (Queen Charlotte Islands).

A wide variety of factors can affect seabird populations including changes in key prey species, oil spills, toxic contaminants, overfishing, gillnet bycatch, predation and climatic conditions. Human disturbance during critical nesting and fledging periods can have significant impact due to gull and crow predation when parental birds leave the nest. In Haida Gwaii the main factor influencing many seabird populations appears to be introduced predatory mammals, including raccoons, and both Norway and black rats

The objective of commercial recreation guidelines for Red- and Blue-listed seabirds is to maintain the current distribution and abundance of their populations in the province.

Status of seabird species breeding in British Columbia (Source Canadian Wildlife Service)

Species	Estimated numbers	Status	Comments
Double-crested Cormorant	4,000	Red-listed	declining, breeding restricted to Strait of Georgia
Brandt's Cormorant	200	Red-listed	irregular breeder
Pelagic Cormorant	9,000	*pelagicus* subspecies Red-listed	widespread coastal breeder
Common Murre	9,000	Red-listed	scarce breeder
Thick-billed Murre	20	Red-listed	at southern limit of range
Ancient Murrelet	540,000	Blue-listed	impacted by rat and raccoon predation
Horned Puffin	60	Red-listed	at southern limit of range
Tufted Puffin	78,000	Blue-listed	severe reproductive failure at Triangle Island 1994-98
Cassin's Auklet	2,700,000	Blue-listed	Triangle Island population is declining

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Raptors: Bald Eagle

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Avoid harassment by humans	1.1	Minimize human activities within 150 m of active nests between February and July.	1.1.1	No human caused disruption in natural behaviour
		1.2	Minimize human activities within 150 m major wintering habitat, roosting and foraging sites		
		1.3	Train staff and clients in appropriate behaviour in the vicinity of Bald Eagles and their habitats.		
2.0	Protect the habitat	2.1	Maintain all existing habitat components within 150 m of nest trees.	2.1.1	Habitat maintained
		2.2	Prevent facility development within 150 m of nest trees.		

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Bald Eagle

Principle source of information:
Olliff, T., Legg, K., & Kaeding, B. (1999). *Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment.* Yellowstone National Park, WY: Report to the Greater Yellowstone Coordinating Committee.

Bald Eagles are a highly visible species to the public. The key issues of concern relate to nest sites (that are usually located in riparian areas), night-time communal roosts in fall and winter, concentrated food sources (salmon spawning areas, ungulate winter ranges at low elevations).

Human activities have various effects on Bald Eagles. In the breeding season, temporary human activities influence nest building, egg laying and incubation. In winter, human activities can influence feeding and communal roosting at a time when Bald Eagles are food-stressed. The responses of eagles vary among individuals and among populations, but documented reactions range from avoidance and displacement, to abandonment of nests and reproductive failure due to prolonged absences of adults from young birds at the nest. The likelihood of nest site abandonment is greatest early in the breeding season, during the courtship and nest building phases; they are more likely to put up with some disturbance when they have eggs or young in the nest. Bald Eagles change their feeding activities and show shifts in spatio-temporal use patterns. High levels of human activities can increase energy demands, and can increase mortality rates. The nest structures of Bald Eagles are protected throughout the year, whether active or not, under Section 34 of the British Columbia *Wildlife Act*.

The objective of commercial recreation guidelines for the Bald Eagle is to maintain the current distribution and abundance of their populations in the province.

General Considerations for Raptors

Most concern for raptors focuses on the impact of human activities during the breeding and rearing season, and the loss of nest sites. Raptors are sensitive to disturbance and although some species will actively defend their nest sites, given sufficient disturbance, raptors will abandon nests.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Raptors: Red- and Blue-listed Cliff-nesting Falcons

Gyrfalcon (BLUE), Peregrine Falcon - *anatum* ssp. (RED)- *pealei* ssp. (BLUE) , Prairie Falcon (RED)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect aeries from human disturbance	1.1	Prevent rock climbing within 500 m of nests, and hang-gliding on or near occupied cliff nests until the offspring have fledged	1.1.1	No activity near active sites.
		1.3	Prevent helicopter or fixed-wing flyovers near occupied cliff nests until the offspring have fledged		
		1.3	Avoid development within 250 m of occupied cliff nesting area, and construction projects involving major disturbance like blasting, road and building construction 1000 m away during the breeding season.	1.2.1	No development within 250 m of cliff nests, and construction within 1000 m during breeding season
2.0		2.1	Train staff and clients in appropriate behaviour in the vicinity of falcons and their habitats	2.1.1	Active support and awareness from staff and visitors
1.0	Protect the population of this species	1.1	Document and report any known species nesting/breeding locations.	1.1.1	Existing range well known
		1.2[M]	For major developments, identify and map nesting and foraging habitats	2.1.1	Breeding sites known
			Promote stewardship where deemed effective to protect active sites from human disturbance	4.4.1	Protective support groups

Species	Conservation status in B.C.	Nest site features	Remarks
Prairie Falcon	Red-listed	ledges or cavities on cliffs	Nest sites frequently re-used;
Peregrine Falcon, anatum ssp.	Red-listed	ledges or cavities on cliffs adjacent to fresh or marine waters	Rarely on large broken-topped tree or ledges of tall city buildings. Nest sites frequently re-used
Peregrine Falcon, pealei ssp.	Blue-listed	ledges or cavities on cliffs adjacent to marine waters	Nest sites frequently re-used. Occurs on Queen Charlotte and Vancouver Islands, usually near seabird colonies
Gyrfalcon	Blue-listed	Cliff ledges, usually at higher elevation in mountains	Occasionally nest in trees, breeding restricted to extreme northern portions of province

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Falcons: Red- and Blue-listed Cliff-nesting species

Gyrfalcon (BLUE), Prairie Falcon (RED), Peregrine Falcon - *anatum* ssp. (RED)- *pealei* ssp. (BLUE)

Principal source of information:

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia.* Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks.

There are three species, encompassing four subspecies, of cliff-nesting raptors that are of conservation concern. These species lay their eggs on cliffs, usually with little effort at nest building. Generally, the season for egg laying and rearing of young extends from April through to September During this period, the birds are sensitive to disturbance whether from the air via aircraft and hang gliders, or from the ground by rock-climbers. Little information exists on the sensitivity of these raptors to these types of disturbances, though like other raptors, sensitivity and likelihood of abandonment are highest early in the breeding season. Given their conservation status, a precautionary approach is warranted.

The objective of commercial recreation guidelines for Red- and Blue-listed cliff-nesting raptors is to maintain the current distribution and abundance of their populations in the province.

Peregrine Falcon*

The objective of commercial recreation guidelines for the Peregrine Falcon* is to maintain the current distribution and abundance of their populations in the province. The following additional commercial recreation guidelines apply to all populations of Peregrine Falcon:

A. Prevent in filling or draining of wetland foraging habitats.

B. Avoid the use of pesticides in the vicinity of nesting or foraging areas.

Prairie Falcon

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other_species/species-14.htm

The objective of commercial recreation guidelines for the Prairie Falcon* is to maintain the current distribution and abundance of their populations in the province. The following additional commercial recreation guidelines apply to all populations of Prairie Falcon:

A. Maintain grassland foraging habitats in late seral stage.

B. Avoid the use of pesticide in the vicinity of nesting or foraging areas.

* Location information on these species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

General Considerations for Raptors

Most concern for raptors focuses on the impact of human activities during the breeding and rearing season, and the loss of nest sites. Raptors are sensitive to disturbance and although some species will actively defend their nest sites, given sufficient disturbance, raptors will abandon nests, especially early in the courtship and nest preparing stages before they have invested time and energy in laying eggs and rearing young.

Raptors: Red-Listed Tree-nesting Hawks

Broad-winged Hawk, Ferruginous Hawk*, Northern Goshawk-*laingi* subspecies*, Swainson's Hawk*

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect the populations of these species	1.1	Document and report any known nesting/breeding locations of Broad-winged Hawk, Swainson's Hawk, Ferruginous Hawk and Northern Goshawk-*laingi* ssp	1.1.1	Known nesting/breeding locations of these species including locations are recorded
2.0	Maintain high quality habitat near nests	2.1	Prevent facility development within 150 m of nest trees of Broad-winged Hawk, Swainson's Hawk, and Ferruginous Hawk	2.1.1	Successful nesting
		2.2	Maintain all existing habitat components within 150 m of nest trees of Broad-winged Hawk, Swainson's Hawk, and Ferruginous Hawk	2.2.1	Habitat maintained
3.0	No harassment by humans	3.1	Train staff and clients in appropriate behaviour in the vicinity of tree-nesting hawks and their habitats.	3.1.1	No abandonment of nests
		3.2	Minimize human activities within 150 m of active nests between February and July.	3.2.1	Successful nesting

Species	Status in B.C.	Nest features	Remarks
Northern Goshawk, *laingi* ssp.	Red-listed	Stick nest in tall tree; usually in conifers	Often has several alternate nests in territory. Restricted to coastal forests
Broad-winged Hawk	Red-listed	Stick nest in either conifer or deciduous trees	Largely restricted to NE corner of BC
Swainson's Hawk	Red-listed	Stick nest	Nest often re-used. Restricted to interior grassland habitat
Ferruginous Hawk	Red-listed	Stick nest	Nests re-used; also nests in bushes, cliffs and on ground. Restricted to interior grassland habitats

Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Raptors: Red-Listed Tree-nesting hawks

Broad-winged Hawk*, Swainson's Hawk*, and Ferruginous Hawk*, Northern Goshawk-*laingi* ssp*

Principal source of information:

Fraser, D. F.,et al. (1999). *Rare birds of British Columbia.* Victoria, BC: Wildlife Branch, British Columbia Ministry of Environment, Lands and Parks.

Iverson, G. C., et al. (1996). *Conservation assessment for the Northern Goshawk in southeast Alaska.* Portland, OR: USDA Forest Service.

All these species lay their eggs in relatively large, visible stick nests in trees,. Generally, the season for egg laying and rearing of young extends from April through August. Any activities that destroy current and future nest trees and nesting habitat could have adverse impacts on their populations.

Northern Goshawk

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-15.htm

Northern Goshawks are forest predators, usually associated with mature and old growth forests. Because of their dependence on older forests, they have been the subject of intensive research and conservation concern. They feed on forest-dwelling birds and mammals, ranging in size from Varied Thrush and Red Squirrels, to grouse and hares. The key issues are disturbance during the nesting and rearing season, and habitat management and conservation of nest sites and post-fledging areas.

Northern Goshawks nest in large trees, and actively defend these sites. Nesting birds are sensitive to human disturbance, and will attack and call loudly when people approach too closely.. Research results indicate that disturbance can cause Goshawks to abandon nests, especially if it occurs early in the breeding season.

The following additional commercial recreation guidelines apply to all populations of Northern Goshawk:

A. Maintain old growth forest, wildlife trees, and coarse woody debris within the 12 ha nest area for Northern Goshawks

B. Prevent facility development within a 12 ha nest area centred on known nest trees of Northern Goshawks

The objective of commercial recreation guidelines for the Broad-winged Hawk*, Swainson's Hawk, Ferruginous Hawk*, and Northern Goshawk-*laingi* ssp* is to maintain the current distribution and abundance of their populations, and to minimize or prevent nest failures.

Ferruginous hawk

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-13.htm

* Location information on these species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Raptors: Red- and Blue-listed Tree-nesting Owls

Flammulated Owl (BLUE), Northern Pygmy-Owl- *swarthi* ssp. (BLUE), Northern Saw-whet Owl- *brooksi* ssp. (BLUE), Spotted Owl (RED), Western Screech-Owl - *macfarlanei* ssp. (RED)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect the populations of these species	1.1	Document and report any known nesting/breeding locations of these species	1.1.1	Known nesting/breeding locations documented
		1.2	For major developments, identify and map nesting habitats	1.2.1	Habitat maintained
2.0	Protect the existing populations	2.1	Avoid the use of pesticides near known nesting sites	2.1.1	No pesticide use in known nesting areas
		2.2	Train staff and clients in appropriate behaviour in the vicinity of owls and their habitats	2.2.1	Active support and awareness from staff and visitors
4.0	Maintain wildlife trees	4.1	Prevent the cutting of wildlife trees or standing dead snags except as necessary for safety (topping should be considered as a safety option).	4.1.1	Ample supply of wildlife trees

Species	Conservation status	Nest site features
Spotted Owl	Red-listed	Tree cavity or abandoned hawk's nest
Western Screech-Owl - *macfarlanei* ssp.	Red-listed	Natural cavity or deserted woodpecker hole
Northern Pygmy-Owl - *swarthi* ssp.	Blue-listed	Natural cavity or deserted woodpecker hole
Flammulated Owl	Blue-listed	Natural cavity or deserted woodpecker hole

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Raptors: Red- and Blue-listed Tree-nesting Owls

Flammulated Owl (BLUE), Spotted Owl (RED), Western Screech-Owl - *macfarlanei* ssp. (RED), Northern Pygmy-Owl, *swarthi* ssp. (BLUE), and Northern Saw-whet Owl, *brooksi* ssp. (BLUE)

Principal source of information:

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 600.

Flammulated Owl

In British Columbia, Flammulated Owls inhabit mature and old-growth montane forests, primarily within the Interior Douglas-fir biogeoclimatic zone. Forests over 100 years old seem to be preferred.

The objective of commercial recreation guidelines for the Flammulated Owl is to maintain their current distribution and abundance within the province. The following additional commercial recreation guidelines apply to all populations of Flammulated Owl:

A Minimize disturbance of mature and old growth forest habitats where Flammulated Owl occurs.

Western Screech-owl (*macfarlanei* subspecies)

In British Columbia, the macfarlanei subspecies of the Western Screech-Owl is found year-round in deciduous riparian forests and open ponderosa pine and water birch woodland habitats, in the southern Okanagan Valley south of Kelowna.

The objective of commercial recreation guidelines for the Western Screech-owl - *macfarlanei* subspecies is to maintain their current distribution and abundance within the province. The following additional commercial recreation guidelines apply to all populations of Western Screech-owl - *macfarlanei* subspecies:

Prevent development in or alteration of riparian deciduous forest where they are known to occur.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Raptors: Red and Blue-listed Ground-nesting Owls

Short-eared Owl (BLUE), Burrowing Owl (RED)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect the grass and marsh habitat	1.1	Prevent development of facilities in high-quality grassland and meadow habitat within the breeding range of Short-eared Owls and Burrowing Owls.	1.1.1	Habitat well used by this species
		1.2	Do not allow grazing or haying near nest sites during critical periods including winter	1.2.1	No loss in habitat effectiveness
		1.3	Prevent OHV, mountain bikes, or domestic animals on grasslands and meadows used for nesting.	1.3.1	
2.0	Protect the species from toxic substances	2.1	Avoid the use of pesticides near known nesting sites	2.1.1	No pesticide use in known nesting areas
3.0	Avoid harassment	3.1	Staff training to ensure non-intrusive viewing	3.1.1	No intrusive behaviour
		3.2	Do not allow dogs within 250m of nesting area	3.2.1	Nest sites not disturbed
4.0	Identify use areas	4.1[M]	Identify and map nesting habitats	4.1.1	Nest sites known

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Short-eared Owl and Burrowing Owl

Key issues of concern: Loss and fragmentation of foraging, nesting and wintering habitat, human disturbance of nesting areas.

Principal sources of information:

Blood, D. A., & Low, D. (1998). *Burrowing Owl* (Wildlife in British Columbia At Risk). Victoria, BC: Ministry of Environment, Lands and Parks http://wlapwww.gov.bc.ca/wld/documents/burrowl.pdf

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 600.

Short-eared Owls and Burrowing Owls nest in open treeless areas such as grasslands, rangelands, dry marshes, farmlands, brushy fields and forest clearings.

Information needs include documentation of nest sites, identification and mapping of nesting and foraging habitat, and assessments of potential impacts on nest sites or breeding success.

Winter habitats for Short-eared Owls are concentrated in the lower Fraser River valley in coastal grasslands and old-field habitats, while Burrowing Owls are migratory and do not remain in British Columbia in the winter.

The objective of commercial recreation guidelines for the Short-eared Owl and Burrowing Owl are to maintain their current distribution and abundance within the province.

Songbirds: Red- and Blue-listed species

Bay-breasted Warbler (RED), Black-throated Green Warbler (BLUE), Bobolink (BLUE), Brewer's Sparrow *-breweri* ssp. (RED), Canada Warbler (BLUE), Canyon Wren (BLUE), Cape May Warbler (RED), Connecticut Warbler (RED), Grasshopper Sparrow (RED), Gray Flycatcher (BLUE), Lark Sparrow (RED), Nelson's Sharp-tailed Sparrow (RED), Philadelphia Vireo (BLUE), Pine Grosbeak *-carlottae* ssp. (BLUE), Purple Martin (RED), Sage Thrasher (RED), Smith's Longspur (BLUE), Steller's Jay *-carlottae* ssp. (BLUE), Vesper Sparrow *-affinis* ssp. (RED), Yellow-breasted Chat (RED)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect the population of these species	1.1 [M]	Document and report any known nesting/breeding locations of this species	1.1.1	Existing range well known
		1.2 [M]	Do not allow dogs within 250 m of nesting area for ground-nesting species	2.2.1	No disruption of natural behaviour caused by dogs
2.0	Breeding range well documented	2.2 [M]	Identify and map breeding sites, nesting and foraging habitats	2.1.1	Breeding sites known
3.0	Maintain critical habitat	3.1	Prevent development or clearing in critical nesting and foraging habitat	3.1.1	Critical habitat maintained
4.0		4.1	Avoid the use of pesticides/herbicides in known nesting sites	4.1.1	No pesticide use in known nesting areas
5.0		5.1	When detrimental, minimize livestock grazing in occupied habitat	5.1.1	Habitat maintained
	Avoid harassment particularly during courtship and nesting	5.2	Staff and client training to ensure non-intrusive viewing	5.1.2	No disruption of natural behaviour caused by human presence

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Songbirds: Red- and Blue-listed species

The objective of commercial recreation guidelines for Red- and Blue-listed songbirds is to maintain their current distribution and abundance within the province.:

Principal sources of information:

Camp, R. J., & Knight, R. L. (1998). Rock climbing and cliff bird communities at Joshua Tree National Park, California. *Wildlife Society Bulletin, 26*, 892-898.

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks.

Canyon Wren

Key issues of concern: nesting sites on cliffs

Few specific studies have examined impacts on Canyon Wren. In Joshua Tree National Park, California, a study examined bird communities in relation to three levels of rock climbing: unclimbed cliffs, moderate-use cliffs and popular cliffs. Although the sample size was small, Canyon Wrens were only observed at unclimbed sites: only three other of the 33 species had a similar distribution. The authors recommended that programs be implemented to monitor the use of cliffs by climbers and to evaluate spatial and temporal changes in number of birds, including changes in the number of invasive species.

The objective of commercial recreation guidelines for the Canyon Wren is to maintain their current distribution and abundance within the province by minimizing nest failures and optimizing over-winter survival. The following additional commercial recreation guidelines apply to all populations of Canyon Wren:

A. Prevent facility development 100 m of nesting habitats.

B. Prevent removal of talus rock on or near nesting and foraging habitats.

C. Prevent rock climbing on or near occupied nesting and foraging habitats from May through July.

D. Avoid rocking climbing on or near over-wintering habitats from November through February.

Bobolink

Key issues of concern: nesting and foraging habitats

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-22.htm

The Bobolink is a migratory, Blue-listed species. It nests in hayfields and moist meadows, and can therefore be affected by the timing of hay cropping during incubation. Fraser et al. (1999) suggest that mowing be delayed until after birds leave in August and that the use of pesticides on breeding grounds be avoided.

The objective of commercial recreation guidelines for the Bobolink is to maintain their current distribution and abundance within the province by minimizing nest failures. The following additional commercial recreation guidelines apply to all populations of Bobolink:

A. Avoid grazing or mowing of nesting and foraging habitats prior to August.

For distribution and map of Brewer's Sparrow, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-23.htm

For distribution and map of Grasshopper Sparrow, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-24.htm

For distribution and map of Sage Thrasher, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-25.htm and http://wlapwww.gov.bc.ca/wld/documents/sagethrasher.pdf

For distribution and map of Yellow-breasted Chat, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-26.htm

Songbirds: White-throated Swift (Blue)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain critical habitat	1.1	No development in close vicinity to occupied cliff nesting areas	1.1.1	Nesting sites not abandoned
2.0	Protect from harassment	2.1	No rock climbing in close proximity (10 m or less) to occupied cliff nesting areas	1.2.1	No harassment by humans
3.0	Protect the population of this species	3.1	Document and report any known nesting/breeding locations of this species	3.1.1	Nesting/breeding locations noted

[M] = Strategy required for major development only

White-throated Swift

Principal sources of information:

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks.

White-throated Swifts are cliff-dwelling and nesting birds, hawking insects in the air around their breeding areas. Nests are made from feathers, frass and other plant materials and glued, using the bird's saliva, into cracks, crevices and small ledges.

Rock climbing or hang-gliding are activities that have the potential to disturb birds during breeding periods. As well, there is evidence that blasting activity close to or on the nest cliff may cause birds to abandon their nesting sites.

The objective of commercial recreation guidelines for the White-throated Swift is to maintain the current distribution and abundance of their populations in the province.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Upland game birds: Sharp-tailed Grouse* – *columbianus* ssp. (Blue)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect the bunchgrass and riparian habitat	1.1	Avoid facility development within 1 km of leks[1], nesting areas & critical winter habitats	1.1.1	Habitat well used by this species
		1.2	Prevent habitat alteration of leks, nesting areas and critical winter habitats No alterations or development on critical areas	1.2.1	No loss in habitat effectiveness
		1.3	Minimize livestock use of Sharp-tailed Grouse habitats (leks, nesting, and wintering areas) where potential exists for loss of adequate vegetative cover and disturbance to breeding birds.		
2.0	Avoid harassment	2.1	Train staff and clients in appropriate behaviour in the vicinity of Grouse especially near leks		
		2.2	Keep dogs 250 m from leks, nesting area and critical winter habitats	2.2.1	Nest sites not disturbed
3.0	Protect the species from toxic substances	3.1	Avoid the use of pesticides, including herbicides, near leks and known nesting sites	3.1.1	No toxic effects due to pesticides
4.0	Maintain the natural population	4.1[M]	Identify and map leks, nesting areas and critical winter habitats	4.1.1	Natural populations identified and mapped

[M] = Strategy required for major development onl

*Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

[1] Leks are areas where males congregate and display to attract females. Breeding occurs at the lek, but the females then move to other habitats to nest and raise their young.

SHARP-TAILED GROUSE

Key issues of concern: lekking grounds, nesting habitat, critical winter habitat

Primary sources of information:

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/) for $30.00, Inventory Number 600.

Ritcey, R. (1995). *Status of the Sharp-tailed Grouse (columbianus subspecies) in British Columbia* (Wildlife Working Report WR-70). Victoria, BC.: BC Ministry of Environment, Lands and Parks.

Baydeck, R. K., & Hein, D. A. (1987). Tolerance of Sharp-tailed Grouse to lek disturbance. *Wildlife Society Bulletin, 15*, 535-539.

Most grouse species in BC are widespread and abundant and there is little concern for the impact of backcountry recreational activities. However, the Sharp-tailed Grouse are at risk and precautions need to be taken to minimise their disturbance

Sharp-tailed Grouse are a Blue-listed species with relatively low populations and restricted distributions. Of particular concern is the need to minimize habitat damage and prevent disturbance of the lek sites where males perform courtship displays and breed with females. Females avoid disturbed leks, and in Idaho, over-enthusiastic photographers have caused grouse to abandon leks. In addition, protection also needs to be afforded to their nesting and winter foraging habitats.

The objective of commercial recreation guidelines for the Sharp-tailed Grouse is to maintain its current distribution and abundance within the province

* Location information on this species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Upland game birds: White-tailed Ptarmigan- *saxatalis* spp. (Blue)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain critical habitat	1.1	Identify and map breeding sites and critical winter habitats	1.1.1	Natural populations, breeding and critical winter habitat identified
		1.2	Prevent habitat alteration of nesting areas and critical winter habitats	1.2.1	Breeding and critical winter habitat maintained
2.0	Avoid harassment	2.1	Train staff and clients in appropriate behaviour in the vicinity of Ptarmigan and their habitats		
		2.2	Avoid facility development within 1 km of major nesting areas & critical winter habitats		
		2.3	Keep dogs 250 m from nesting area and critical winter habitats	2.2.1	Nest sites not disturbed
3.0 [M]	Protect the species from toxic substances	3.1	Avoid the use of pesticides (including herbicides) near known nesting sites	3.1.1	No toxic effects due to pesticides

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

White-tailed Ptarmigan

Key issues of concern: nesting habitat, critical winter habitat

Primary sources of information:

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 600.

White-tailed Ptarmigan-*saxatalis* subspecies is a Blue-listed species with relatively low populations that only occur in mountainous areas of Vancouver Island.

The objective of commercial recreation guidelines for the White-tailed Ptarmigan-*saxatalis* is to maintain its current distribution and abundance within the province.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Waterfowl: American White Pelican (Red)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural population	1.1	Document and report any known species nesting/breeding locations	1.1.1	Water levels maintained
		1.2[M]	Identify and map loafing and foraging habitats	1.2.1	No disturbance of nesting birds
2.0	Stable water levels	2.1	Prevent alteration of natural water regimes (dams and diversions) associated with breeding, loafing and foraging habitats.	2.1.1	Feeding habitat maintained
3.0	Maintain high quality feeding habitat	3.1	Prevent facility development within 500 m of loafing and foraging habitats conflict.	3.1.1	continued foraging
4.0	No disturbance when nesting at Sturm Lake, or loafing and foraging areas elsewhere	4.1	The Wildlife Act directs that there will be no human activity on or around Stum Lake between March 1 and August 31. Maintain seasonal no-fly zones for helicopters and fixed-wing aircraft that are a 600 m vertical distance from the breeding colony at Stum Lake.	4.1.1	Successful nesting, birds remain in area.
		4.2	Avoid approaching within 250 m of loafing and foraging pelicans outside of Stum Lake		
		4.3	Prevent dogs from approaching within 250 m of loafing and foraging habitats see above		
		4.4	Avoid aircraft landings and takeoffs on or near loafing and foraging habitats see above		
		4.5	Train staff and clients in appropriate behaviour in the vicinity of American white pelicans and their habitats while they are breeding, foraging or loafing.		

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

American White Pelican

Principal source of information:
Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 600.

For distribution and maps, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other species/species-07.htm

Although they have been observed at over 50 lakes on the Fraser Plateau during the breeding season, American White Pelicans in British Columbia nest in only one location, at Stum Lake, 70 km northwest of Williams Lake. The other lakes are used only for loafing and foraging and less than half of these are regularly used by significant numbers of pelicans. The single breeding population is Red-listed and designated as Endangered in British Columbia. Although the nesting area is protected in a Provincial Park, foraging sites are not currently protected. The Wildlife Act directs that there will be no human activity on or around Stum Lake between March 1 and August 31

The objective of commercial recreation guidelines for the American White Pelican is to maintain its current distribution and abundance in the province.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Waterfowl: Harlequin Duck

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Avoid loss of critical habitats	1.1	Identify and map potential nesting and foraging habitats	1.1.1	Critical habitats mapped
		1.2	Prevent facility development on critical riverine and riparian habitats	1.2.1	Number of facilities developed in key habitats
2.0	Avoid nesting and fledgling period disturbance	2.1	Avoid activities on critical habitats during nesting and fledgling period (May to September)	2.1.1	Number of disturbing events per day or week during key periods
		2.2	Train staff and clients in appropriate behaviour in the vicinity of Harlequin Ducks and their habitats.		
3.0	Maintain water quality	3.1	No ground disturbance in riparian zones along nesting river sections	3.1.1	No siltation increase. Integrity of riparian zone maintained.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Harlequin Duck

Primary sources of information:

Campbell, R. W., Dawe, N. K., McTaggart-Cowan, I., Cooper, J. M., Kaiser, G. W., McNall, M. C. E., & Smith, G. E. J. (1997). *The Birds of British Columbia* (Vol. 1). Vancouver, BC: UBC Press.

Clarkson, P. (1992). *A preliminary investigation into the status and distribution of Harlequin Duck in Jasper National Park* (Unpublished technical report). Jasper, AB: Natural Resource Conservation, Jasper National Park.

Joslin, G., & Youmans, H. (1999). *Effects of recreation on Rocky Mountain Wildlife: A review for Montana*. Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society http://www.montanatws.org/PDF%20Files/3bird1.pdf

Harlequin Ducks winter in marine areas of coastal British Columbia, and breed adjacent to rivers and streams in the interior, often at elevations above 1000 m. Harlequin Ducks and their broods can be significantly disturbed and displaced by water craft and rafts, seasonal curtailment of these activities may be required. For instance, river rafting in Jasper National Park was substantially reduced to protect the species during the nesting and fledging period.

The objective of commercial recreation guidelines for the Harlequin Duck is to maintain the current distribution and abundance of their populations in the province.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Waterfowl: Western Grebe (RED)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural populations	1.1[M]	Identify critical nesting habitat and develop plans to avoid disturbance	1.1.1	Critical habitat maintained
		1.2	Document and report any known species nesting/breeding locations	1.2.1	Species nesting/breeding locations noted and reported
		1.3	Avoid operating motorized watercraft in the midst of wintering aggregations	1.3.1	No harassment of birds
2.0	Maintain habitat	2.1	Prevent in-filling, draining or flooding of marsh habitats used by Western Grebes and maintain natural cover around nesting wetlands	2.1.1	Cover maintained
		2.2	Prevent alteration of natural water regimes (dams and diversions)	2.2.1	Natural water levels maintained
		2.3	Avoid the use of pesticides/herbicides in the vicinity of nesting or foraging areas	2.3.1	No pesticides used in vicinity
3.0	Avoid harassment of nesting birds	3.1	Prevent use of motorized watercraft on identified lake areas (minimum buffer zone of 250 m) during the breeding period, as nests are easily swamped.	3.1.1	No disruption during nesting period
		3.2	Maintain a no human or pet contact buffer zone of 250 m around nest areas from April to September	3.2.1	No disruption during breeding season
		3.3	Staff and client training to ensure non-intrusive viewing	3.3.1	No disruption during breeding season

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Western Grebe

Key issues of concern: nesting colonies and season, winter aggregations

Principal source of information:

Burger, A.E. 1997. *Status of the Western Grebes in British Columbia.* BC Ministry of Environment, Lands and Parks, Victoria, BC. Wildlife Working Report WR-87. 40pp.

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia.* Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 600.

For distribution and maps, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-08.htm

Western Grebes are colonial nesting waterbirds that breed on large freshwater marshes and lakes. Breeding only occurs regularly at three colonies in BC, with the total breeding population restricted to about 200 pairs As breeding is continuous through the season, breeding colonies are active from late April through late August. Breeding habitat is characterized by extensive emergent vegetation and stable water levels from nest building through incubation.

Grebes are vulnerable to human disturbance and habitat alterations. The wash of power-boats can flood and/or tip over their nests causing the eggs to fall out. Disturbance by people in boats, canoes, or by swimmers, may cause grebes to vacate nests, leaving their eggs and young exposed to the weather and to predation. In B.C., human disturbance has caused the loss of at least three nesting areas. Coastal wintering aggregations of Western Grebes can reach 10,000 or more individuals, making them vulnerable to events such as oil and chemical spills.

The objective of commercial recreation guidelines for the Western Grebe is to maintain the current distribution and abundance of their populations in the province.

Interim Wildlife Guidelines for Commercial Recreation: **Birds**

Woodpeckers: Red- and Blue-listed species

Hairy Woodpecker - picoideus ssp (BLUE), Lewis's Woodpecker (BLUE), White-headed Woodpecker (RED), Williamson's Sapsucker - *nataliae* ssp.(RED), Williamson's Sapsucker - *thyroideus* ssp. (BLUE).

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Identify species distribution	1.1	Document and report any known species nesting/breeding locations.	1.1.1	Suitable habitat maintained
2.0	Maintain the natural population	2.1[M]	Identify and map breeding sites and habitats.	2.1.1	No disruption of natural behaviour caused by human presence
3.0	Maintain suitable habitat	3.1	Minimize disruption of mature and old growth forest habitat.	3.1.1	Quality habitat maintained
		3.2	Prevent the cutting of wildlife trees or standing dead snags except as necessary for safety (topping should be considered as a safety option).		
4.0	Avoid harassment	4.1	Staff training to ensure non-intrusive viewing		
		4.2	Maintain a 100 m buffer around occupied nests		

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Woodpeckers: Red- and Blue-listed species

Williamson's Sapsucker - *nataliae* ssp.(RED), Williamson's Sapsucker - *thyroideus* ssp. (BLUE), White-headed Woodpecker (RED), Lewis's Woodpecker (BLUE), and Hairy Woodpecker - *picoideus* ssp (BLUE).

Principal sources of information:

Blood, D. A. (1997). *White-headed woodpecker* (Wildlife in British Columbia At Risk). Victoria, BC: Ministry of Environment, Lands and Parks. http://wlapwww.gov.bc.ca/wld/pdocuments/woodpecker.pdf

Fraser, D. F., Harper, W. L., Cannings, S. G., Cooper, L. R., & Cooper, J. M. (1999). *Rare birds of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 600.

The objective of commercial recreation guidelines for Red- and Blue-listed woodpeckers is to maintain their current distribution and abundance within the province.

White-headed Woodpecker

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-21.htm

Unlike other woodpeckers which feed primarily on wood-boring insects, the food source of the White-headed Woodpecker is largely the seeds of ponderosa pine trees. This dependence on such a specific food supply restricts the White-headed Woodpecker to the distribution of this tree species, which themselves are confined to the southern interior of the province at low elevations, and have been under extensive alterations from human activities for the past 80 years. They nest in standing dead and large mature living trees. The protection of snags and mature ponderosa pine is critical to the maintenance of this species of woodpecker. It is almost certain there are fewer than 100 birds living in the province.

Lewis's Woodpecker

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-20.htm

This woodpecker can nest semi-colonially – in such cases, buffers should be around the colony area.

Interim Wildlife Guidelines for Commercial Backcountry Recreation in British Columbia

Chapter 4

MAMMALS

Dall Sheep
Photo: BC Parks

BRITISH COLUMBIA
Ministry of Water, Land and Air Protection
May, 2002

Biodiversity Branch
Ecosystem Planning and Standards Section
Email: Ecosystem.Planning@gems3.gov.bc.ca

MAMMAL SPECIES	Page
Badger	2
Bats: Red- and Blue-listed species	4
Bison - athabascae ssp. - bison ssp	6
Caribou* (Mountain ecotype)	8
Cascade Mantled Ground Squirrel	24
Exotic Pack Animals	34
Fisher	12
Fringed Myotis	4
Gray Wolf	14
Great Basin Pocket Mouse	24
Grizzly Bear	16
Keen's Long-eared Myotis	4
Least Chipmunk – orocetes ssp.	24
Least Chipmunk – selkirki ssp.	24
Lynx	20
Meadow Jumping Mouse – alascensis ssp.	24
Mountain Beaver - rainieri ssp.	24
Mountain Beaver – rufa ssp.	24
Mountain Goat	22
Northern Bog Lemming – artemisiae ssp.	24
Northern Long-eared Myotis	4
Northern Pocket Gopher – segregatus ssp.	24
Pallid Bat	4
Red-tailed Chipmunk – ruficaudus ssp.	24
Red-tailed Chipmunk – simulans ssp.	24
Rodents: Red- and Blue-listed species	24
Sea Otter	26
Sheep	28
Southern Red-backed Vole – galei ssp.	24
Southern Red-backed Vole – occidentalis ssp.	24
Spotted Bat	4
Townsend's Big-Eared Bat	4
Townsend's Vole – cowani ssp.	24
Ungulate Winter Range	36
Vancouver Island Marmot	30
Western Harvest Mouse	24
Western Red Bat	4
Western Small-footed Myotis	4
Wolverine	32

ACTIVITY	AFFECTED WILDLIFE	Page
Backcountry Skiing	Wolverine Den Sites	32
Boating	Sea Otters	26
	Grizzly Bears & Other Large Carnivores	16
Caving	Bat Hibernacula	4
Dog-sledding Competitions	Wintering Moose	36
Exotic/Domestic Pack Animals	Ungulates (disease)	8, 22, 28
Extreme Sports Competitions	Ungulates & Sensitive Wildlife	8, 22, 28
Fixed-wing Landings	Ungulates & other Sensitive Wildlife	8, 22, 28
Heli-fishing	Grizzly Bears at Spawning Streams	16
Heli-hiking/camping	Ungulates & other Sensitive Wildlife	8, 22, 28
Heli-skiing	Most Wintering Ungulates	8, 22, 28
	Wolverine Den Sites	32
Heli-snowmobiling	Most Wintering Ungulates	8, 22, 28
	Wolverine Den Sites	32
Heli-touring	Ungulates & other Sensitive Wildlife	8, 22, 28
Helicopters	Mountain Goats	22
	Grizzly Bears & Other Large Carnivores	16
	Ungulates & other Sensitive Wildlife	28, 36
Hiking	Fisher, Lynx, Bobcat	12, 20
	Wolverine Maternal Habitat	32
Hiking with Dogs	Ungulates & other Sensitive Wildlife	22, 28
	Vancouver Island Marmot Colonies	30
Horse Pack Trains	Ungulates & other Sensitive Wildlife	22, 28
Hot Air Ballooning	Mountain Goats	22
Jet Boating	Ungulates & other Sensitive Wildlife	8, 22, 28
Motion Picture Filming	Ungulates & other Sensitive Wildlife	8, 22, 28
Mountain Biking	Ungulates & other Sensitive Wildlife	8, 22, 28
OHVs	Caribou	8
	Grizzly Bears & Other Large Carnivores	16
	Ungulates & other Sensitive Wildlife	8, 22, 28
	Fisher, Lynx, Bobcat	12, 20
River Rafting	Ungulates, Bears	8, 16, 22, 28
Rock Climbing	Mountain Goats/Sheep	22, 28
	Spotted Bat	4
Snow-cat Skiing	Ungulates on Winter Range	36
	Caribou	8
	Wolverine Den Sites	32
	Grizzly Bears & Other Large Carnivores	16
	Ungulates & other Sensitive Wildlife	8, 22, 28
	Fisher, Lynx, Bobcat	12, 20
	Wolf Den Sites	14
Wildlife Interpretation Tours	Ungulates, Bears & other Sensitive Wildlife	all

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Badger (Red)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect the population of this species	1.1	Document and report any known occurrences of this species	1.1.1	Existing range well known
2.0	Home range well documented	2.2[M]	Identify and map badger populations and habitats	2.1.1	Occupied home ranges known
3.0	Protect species from human disturbance	3.1	Train staff and clients on responsible behaviour near badger habitats	3.1.1	Knowledgeable staff ensure no intrusions and no poaching
		3.2	Develop an access management plan that protects badgers from human disturbance in known use areas	3.2.1	Species continues to use the area
		3.3	Maintain badger burrows (badgers use hundreds of burrows)	3.3.1	Badger burrows maintained
4.0	Maintain a dense and diverse prey source	4.1	Maintain populations and habitats of prey species (primarily pocket gophers and ground squirrels)	4.1.1	Abundant prey species and populations

[M] = Strategy required for major development only

Note: Information on this species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Badger

Key issues of concern: den sites, prey densities.

Principal sources of information:

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia.* Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca) Inventory Number 605.

Claar, J. J., Anderson, N., Boyd, D., Cherry, M., Conrad, B., Hompesch, R., Miller, S., Olson, G., Pac, H. I., Waller, J., Wittinger, T., & Youmans, H. (1999). Carnivores. In G. Joslin & H. Youmans (Eds.), *Effects of recreation on Rocky Mountain Wildlife: A review for Montana* (pp. 7.1 - 7.63): Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society http://www.montanatws.org/7carn.pdf.

Carnivores exhibit a wide variety of responses to recreational activities, which range from being highly sensitive to human disturbance (e.g. grizzly bears) to being well adapted to the presence of humans and human activities (e.g. skunks and coyotes). Claar provide a recent, comprehensive survey of recreational impacts on carnivores. Although they focus on Montana, much of their information and recommendations apply to British Columbia.

Badgers are red-listed predators found in open areas and brushlands where they hunt fossorial (burrowing)prey such as ground squirrels and pocket gophers. They are at risk because the area of suitable habitat in the province is small, and much of that habitat has already been greatly modified by human activity. The dry regions of the southern Interior and the east Kootenay provide the habitat that badgers prefer: grasslands, and open pine or fir forests.

The objective of commercial recreation guidelines for Badger* is to maintain the current distribution and abundance of provincial populations.

* Location information on this species is classified as sensitive and is only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Bats: Red- and Blue-listed species*

Fringed Myotis (BLUE), Keen's Long-eared Myotis (RED), Northern Long-eared Myotis (BLUE), Pallid Bat (RED), Spotted Bat (BLUE), Townsend's Big-Eared Bat (BLUE), Western Red Bat (RED), Western Small-footed Myotis (BLUE)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Identify habitats where occurrence is likely	1.1[M]	Identify and map sensitive habitats, including hibernacula, roost sites, and critical foraging habitats.	1.1.1	Habitat mapped
2.0	Maintain critical habitats	2.1	Avoid facility development near sensitive habitats (e.g. caves, old forests, etc).	2.1.1	Large trees and old growth forest characteristics maintained.
		2.2	Avoid the use of pesticides near sensitive bat sites	2.1.2	No pesticide use in sensitive areas
3.0	Avoid disturbance	3.1	Prevent abandonment of hibernacula, maternity colonies and roost sites by preventing access to these sites.	3.1.1	Occupied caves and cliffs continue to be used by this species
		3.2	Train staff and clients on responsible behaviour near sensitive bat habitats.	3.2.1	Knowledgeable staff ensure no intrusions

[M] = Strategy required for major development only

Note: Information on these species is classified as sensitive and only available on a need to know basis from the Regional Endangered Species Specialist.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Bats: Red- and Blue-listed species

Key issues of concern: maternal and daytime roosts, and winter hibernacula (e.g., caves).

Principal sources of information:

Barclay, R. M. R., & Brigham, R. M. (1996). *Bats and Forests Symposium, October 19-21, 1995* (Working Paper 23/1996). Victoria, BC: Research Branch, BC Ministry of Forests.

Nagorsen, D. W., & Brigham, R. W. (1993). *The Bats of British Columbia* (Vol. 1). Vancouver, BC: UBC Press and Royal British Columbia Museum.

For distribution and map of Keen's Long-eared Myotis, see: http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-28.htm

British Columbia is home to 16 species of bats. Most are migratory, arriving in the Province in spring and leaving in the fall: exact timing of these seasonal movements varies with species and location within the province. It is during their period of residency that concern exists regarding impacts of backcountry recreation.

While migratory bats are in B.C., their principal activity is birthing and raising offspring. The important consideration is for the sites used by bats to give birth and raise young (maternity colonies), and the sites used by bats for daytime roosts.

A few species of bats are year-round residents, and so the concern about roosting and den sites exists throughout the year. Hibernation is a critical period in the life cycle of bats, a time they typically lose 20 to 40% of their body weight and severely deplete their reserves of body fat. During this time, they are extremely vulnerable to human disturbance in the caves, mines, buildings, tree cavities, tree bark and rock crevices they use as winter hibernacula. Caving, particularly in winter, can have a very high impact on bat hibernacula. Disturbance from hibernation uses up valuable fat reserves prematurely, with the result that bats disturbed from hibernation may die later of starvation. The sensitivity of bats to human disturbance at roost sites is well established.

The objective of commercial recreation guidelines for Red- and Blue-listed bats is to maintain their current distribution and abundance in the province.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Bison - athabascae ssp. (Red) - bison ssp. (Blue)

Last revision: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect the population	1.1[M]	Identify and map sensitive habitats including calving and rutting habitats and winter ranges by compiling existing information and/or conducting inventories. Assign ratings of high and moderate sensitivity. Operator to be familiar with these sites in the tenured area	1.1.1	Critical habitats such as calving areas, escape terrain, mineral licks and winter ranges known
2.0	Protect bison from harassment	2.1	Seasonally close highly sensitive habitats.	2.1.1	No human caused disturbance during calving period
		2.2	Regulate recreation activities within moderate sensitivity areas as needed. Minimize potential disturbance of bison by modifying use areas and activities to address seasonal habitat needs	2.2.1	No human caused bison disturbance
		2.3	Limit aircraft flight altitude to a minimum of 500 m over designated bison habitats		
		2.4	In cooperation with WLAP staff, select particular routes, heli-ports, heli-pads, and heli-spots for all helicopter activities in the vicinity of bison ranges		
		2.6	Prevent facility development on or near critical seasonal bison habitats.		
		2.7	All access trails and viewing areas should be at least 300 m away from sensitive sites		
		2.8	Train staff and clients on responsible behaviour near bison and their habitats		

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Bison

Key issues of concern: human activity on winter ranges

Principal sources of information:

Aune, K. E. (1981). Impact of winter recreationists on wildlife in a portion of Yellowstone National Park, Wyoming. Unpublished M.Sc., Montana State University, Bozeman, MT.

Olliff, T., Legg, K., & Kaeding, B. (1999). Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment. Yellowstone National Park, WY: Report to the Greater Yellowstone Coordinating Committee.

Bison react to humans on foot more quickly than to humans on mechanized vehicles, such as snowmobiles. In winter, bison use groomed snowmobile trails as travel routes, and the level of use increases with increasing snow depth. Snowmobilers may cause bison to flee when encountered. Aune reported that heavy human activity within 63 yards of trails might temporarily displace wildlife. However, bison do not appear to use groomed ski trails to the same extent.

The objective of commercial recreation guidelines for Bison is to maintain the current distribution and abundance of provincial populations of Plains and Wood Bison, and allow their expansion consistent with provincial management plans and national recovery efforts.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Caribou* (Mountain ecotype-Red)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural distribution of Caribou	1.1[M]	Identify and map seasonal habitats which may be designated as sensitive, including early and late winter ranges. Calving and rutting grounds should also be included in areas of the province where caribou are concentrated for these activities. Assign ratings of high and moderate sensitivity. These ratings may vary for different activities for different areas	1.1.1	Habitats identified and maintained
2.0	Minimize stress caused by human disturbance	2.1	While in the backcountry, stay at a distance which does not disturb or alarm caribou or cause them to leave the immediate area. This distance will be greatest for activities where people may startle caribou with sudden appearances or loud noises.	2.1.1	Caribou activity continues unabated
		2.2	Seasonally close habitats designated as highly sensitive to off-highway vehicles (OHVS)s, snowmobiles, and other forms of transport as deemed appropriate by WLAP staff..	2.2.1	Snowmobile and OHV activity only in planned areas
		2.3	Regulate snowmobile and OHV activity within designated habitats of moderate sensitivity as needed.	2.3.1	
		2.4	Seasonally close habitats designated as highly sensitive to pick-up and drop-off sites for helicopters. Where there is direct overlap of intensive helicopter use with caribou habitats then consideration should be given to horizontal no-fly zones over critical areas.	2.4.1	Caribou not negatively impacted by helicopter activity
		2.5	Limit the frequency of helicopter and fixed-wing flights in habitats designated as highly or moderately sensitive. Ensure that overflying aircraft maintain an altitude above the ground which is higher than either 300 m or a distance determined by the WLAP Regional Manager.	2.5.1	

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

		2.6	In cooperation with WLAP staff, select particular routes, heli-ports, heli-pads, and heli-spots for all helicopter activities in the vicinity of designated Caribou habitat.	2.6.1	
		2.7	Ensure that non-motorized access trails and Caribou viewing areas are well screened from highly sensitive sites. Non-motorized trail users should stay on single trails and avoid wandering in highly sensitive areas.	2.7.1	
		2.8	Train staff and clients in responsible behaviour near caribou habitats which are designated as sensitive	2.8.1	
3.0	Maintain the functional integrity of caribou habitat	3.1	Prevent facility development on or near Caribou habitats designated as highly sensitive.	3.1.1	Absence of facilities in key sensitive caribou habitats

[M] = Strategy required for major development only

* Note: These commercial recreation guidelines apply to all caribou herds which are listed by the Conservation Data Centre (CDC) and/or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), as well as other herds designated by regional WLAP staff.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Caribou

Key issues of concern: human activity on late winter ranges, and at calving

Principal sources of information:

Simpson, K., & Terry, E. (2000). *Impacts of backcountry recreation activities on Mountain Caribou - management concerns, interim management guidelines and research needs* (Wildlife Working Report 99). Victoria, BC: Ministry of Environment, Lands and Parks.

Stevenson, S. K., Armleder, H. M., Jull, M. J., King, D. G., McLellan, B. N., & Coxson, D. S. (1994). *Mountain Caribou in managed forests: Preliminary recommendations for managers.* Victoria, BC: Research Branch, Ministry of Forests. Available at: http://wlapwww.gov.bc.ca/wld/documents/r26_mtcaribou.pdf

All caribou in British Columbia belong to the woodland subspecies (*Rangifer tarandus caribou*), but can be further divided into three ecotypes based on differences in habitat use, behaviour and migration patterns

- *Mountain ecotype* caribou live in southeastern BC. They are characterized by their use of high elevation habitat in late winter where they forage almost exclusively on arboreal lichens.
- *Northern ecotype* caribou lives in west-central and northen BC. During winter, these caribou use low elevation forests or windswept alpine ridges where they crater for terrestrial lichens. They also feed on arboreal lichens during winter but to a lesser extent.
- *Boreal ecotype* of caribou resides in the lowlands of northeastern BC where animals are dispersed in scattered , relatively sedentary groups.

While the concerns over potential adverse impacts of recreation are greatest for the red-listed Mountain Caribou, there are several herds of the northern ecotype that are also facing pressure from winter recreationists (e.g. Telkwa herd). As more road access opens up in the boreal forest in northeast BC, similar impacts are expected for boreal caribou.

Generally, caribou cover wide elevational and geographical ranges over the course of a year, and this extensive movement puts them into contact with many types of recreational and other human activities. The two habitats of greatest concern for caribou are the calving and late winter ranges. During calving, caribou disperse to more isolated areas, with the result that they are susceptible to impacts of wide-ranging OHVs and snowmobiles that are capable of accessing these areas. Late winter habitat use in subalpine and alpine areas can be greatly impacted by backcountry recreation, particularly for the mountain-ecotype of caribou. Since caribou in the subalpine are particularly cryptic and difficult to see, and their tracks are often not visible in wind swept areas, recreationists may be deluded into believing there are no caribou present when this is not the case.

Mountain caribou have evolved a strategy of wintering at alpine and sub-alpine elevations to obtain arboreal lichens and, presumably, to reduce their exposure to predators. With the evolution of the modern snowmobile, many ranges that were previously difficult to access have become readily accessible. The expansion of industrial roads into higher elevation forests has also facilitated access to these subalpine areas by snowmobilers, cross-country skiers and other recreationists. As well, the growth of heli-skiing has introduced still more people into these habitats.

Changes in access and increases in winter recreation on caribou winter range are responsible for several wildlife management concerns. Improved access can have negative implications, including increased chances of illegal harvest of caribou, facilitated by their characteristically unwary, and even inquisitive, behaviour. The

creation of trails, and other linear corridors in an area may also render caribou vulnerable to non-human predators, such as wolves. Winter range areas located near roads and /or highways may experience greater use by recreationists and consequently, suffer potentially greater negative impacts.

Increased recreational activity in caribou habitat may disturb wintering animals. Although a definitive study of the effects of recreation disturbance on woodland caribou has not yet been completed, common sense dictates caution, particularly where the vitality of red-listed species is concerned. There are documented negative responses of caribou to other disturbing stimuli, such as blasting. These included increased movements and energy expenditures and possible habitat displacement. In addition, studies showing the effects of different forms of disturbance (e.g. aircraft, snowmobiles) on other ungulate species have resulted in growing speculation over potential disturbance to caribou in the backcountry. Like other ungulates, caribou may habituate to predictable, non-threatening human behaviours if negative associations are avoided. However, sudden loud noises and unpredictable human behaviour typically result in extreme alarm responses and flight. Biologists suggest that caribou can tolerate low levels of recreational activities but will avoid areas of heavy use, and rank the potential threat of four winter backcountry recreation activities to Mountain Caribou, where snowmobiling was "very high", heli-skiing "high", snowcat skiing "moderate" and backcountry skiing "low".

The objective of commercial recreation guidelines for Caribou is to maintain the current distribution and abundance of provincial herds.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Fisher (Blue)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect the population of this species	1.1	Document and report any known occurrences of this species	1.1.1	Existing range well known
2.0	Home range well documented	2.2[M]	Inventory home range and abundance	2.1.1	Occupied home ranges known
3.0	Protect species from human disturbance	3.1	Train staff and clients on responsible behaviour near Fisher and their habitats	3.1.1	Knowledgeable staff ensure no intrusions and no poaching
		3.2	Develop an access management plan that aims to minimize human access in known use areas	3.2.1	Species continues to use the area
4.0	Maintain a dense and diverse prey source	4.1	Maintain critical elements for prey species, food, cover, denning sites	4.1.1	Abundant prey species and populations
5.0	Maintain sufficient amounts of mature forested habitat and coarse woody debris in known habitats	5.1	Maintain sufficient amounts of mature forested habitat and coast wood debris in known habitats by limiting basal area reduction in known habitats to 20%.	5.1.1	Forest habitat and connectivity maintained and displacement of fisher avoided
		5.2	Prevent removal of coarse woody debris from known habitats	5.2.1	Natural distribution and amounts of Coarse Woody Debris maintained
6.0	Maintain riparian areas with natural distribution of older deciduous trees	6.1	Minimize activities in riparian zones and maintain mature deciduous trees	6.1.1	Riparian habitat maintained

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Fisher

Key issues of concern: natal den sites

Principal sources of information:

Claar, J. J., Anderson, N., Boyd, D., Cherry, M., Conrad, B., Hompesch, R., Miller, S., Olson, G., Pac, H. I., Waller, J., Wittinger, T., & Youmans, H. (1999). Carnivores. In G. Joslin & H. Youmans (Eds.), *Effects of recreation on Rocky Mountain Wildlife: A review for Montana* (pp. 7.1 - 7.63): Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society http://www.montanatws.org/7carn.pdf

Olliff, T., Legg, K., & Kaeding, B. (1999). *Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment*. Yellowstone National Park, WY: Report to the Greater Yellowstone Coordinating Committee.

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-31.htm

Carnivores exhibit a wide variety of responses to recreational activities, which range from being highly sensitive to human disturbance (e.g. grizzly bears) to being well adapted to the presence of humans and human activities (e.g. skunks and coyotes). Claar provide a recent, comprehensive survey of recreational impacts on carnivores. Although they focus on Montana, much of their information and recommendations apply to British Columbia.

In their review of Fisher, Claar et al. (1999) noted that the direct effects of recreational activities on this species have not been systematically examined. However, the literature on Fisher suggests that they are adaptable to human activity, with the possible exception of females with kits. Possible indirect effects include loss, degradation or fragmentation of prime habitats and displacement as a result of increased human access.

The objective of commercial recreation guidelines for Fisher is to maintain the current distribution and abundance of provincial populations.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Gray Wolf

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain natural habitat conditions and behaviour patterns	1.1	Avoid facilities development on or near ungulate winter ranges that also support wolves in winter.	1.1.1	Natural conditions and behaviour maintained
		1.2	Train staff and clients on responsible behaviour near sensitive wolf habitats		
		1.3	Prevent the grooming and use of snowmobile trails after April 1 in identified critical areas		
		1.4	Keep domestic dogs leashed or tethered in areas with significant wolf populations		
2.0	Avoid displacement of wolves during critical denning period	2.1	Close destination areas near wolf dens between April 15 and July 15 to prevent displacement of wolves during critical denning period.		

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Gray Wolf

Key issues of concern: natal den site; rendezvous sites, winter ranges of ungulate prey

Principal sources of information:

Claar, J. J., Anderson, N., Boyd, D., Cherry, M., Conrad, B., Hompesch, R., Miller, S., Olson, G., Pac, H. I., Waller, J., Wittinger, T., & Youmans, H. (1999). Carnivores. In G. Joslin & H. Youmans (Eds.), *Effects of recreation on Rocky Mountain Wildlife: A review for Montana* (pp. 7.1 - 7.63): Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society http://www.montanatws.org/7carn.pdf

Olliff, T., Legg, K., & Kaeding, B. (1999). *Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment.* Yellowstone National Park, WY: Report to the Greater Yellowstone Coordinating Committee.

Weaver, J. L., Paquet, P. C., & Ruggiero, L. F. (1996). Resilience and conservation of large carnivores in the Rocky Mountains. *Conservation Biology, 10*(4), 964-976.

In a review paper, Weaver noted that most field researchers have found that wolves tend to avoid human settlements, and to exhibit slight aversion within about 1 km of open roads, and to use gated and unplowed roads readily. Among their cited papers were data indicating that radio-collared wolves in Alaska avoided accessible roads but were attracted to gated and gravel roads that received little use. Others papers cited noted observations that wolves avoided exploiting their prey near clusters of human habitation and development, especially in narrow river valleys. Weaver also remarked that wolves are sensitive to human disturbance near active den sites from mid-April to July, but provided no evidence in support of this statement. Beyond the problem of disturbance and displacement, domestic dogs also present a significant risk of transmitting infectious diseases and parasites to wolves.

The objective of commercial recreation guidelines for Gray Wolf is to maintain the current distribution and abundance of provincial populations.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Grizzly Bear (Blue)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain functional integrity of habitat	1.1 [M]	Map bear habitat (localized and home range) and connectivity corridors within the tenure area using existing information or by conducting an inventory	1.1.1	Healthy natural bear populations
		1.2	No facility development on or near high use bear habitat eg. critical denning and feeding habitat	1.2.1	New facilities located away from high use bear areas
		1.3	Minimize road and trail (less than 0.5 km/ sq km) development in occupied habitat.	1.3.1	measures of road and trail density
		1.4	Protect existing roadless areas pending completion of Grizzly Recovery for Threatened Population Units		No new roads
		1.5	Apply seasonal road restrictions in areas of important habitat		Establishment of seasonal restrictions
			Limit helicopter and fixed-wing flight to a minimum of 300 m. over critical grizzly bear habitat.		
2.0	Prevent bear access to human supplied foods	2.1	Food and garbage stored in bear proof containers. No long term storage	2.1.1	Number of incidents of bears obtaining human supplied food.
3.0	Minimize bear/human encounters	3.1	Avoid disturbance of bears and habitat degradation. Locate and design facilities, roads and trails to minimize risk of bear/human contacts. Where possible coordinate facilities and infrastructure with other industrial development. Seasonally modify activities and use areas.	3.1.1	Number of bear/human contacts
		3.2	Train staff and clients on responsible behaviour near grizzly bears and sensitive grizzly bear habitats, applying bear viewing guidelines where appropriate.	3.2.1	Number and severity of incidents
4.0	Minimize need to relocation or destroy bears	4.1	Prepare a Bear Emergency Plan, and Bear reporting and monitoring program	4.1.1	Number of relocations and number of bears destroyed

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Grizzly Bear

Key issues of concern: denning habitat, early spring and late fall feeding grounds, especially area-concentrated sites

Principal sources of information:

Claar, J. J., et all. (1999). Carnivores. In G. Joslin & H. Youmans (Eds.), *Effects of recreation on Rocky Mountain Wildlife: A review for Montana* (pp. 7.1 - 7.63). Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society http://www.montanatws.org/7carn.pdf

Olliff, T., Legg, K., & Kaeding, B. (1999). *Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment.* Yellowstone National Park, WY: Report to the Greater Yellowstone Coordinating Committee.

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-32.htm

Bear viewing has special considerations that the viewing of other wildlife does not. The presence of humans in bear habitat can create stress for grizzly bears and cause them to abandon a habitat, either temporarily or permanently. Grizzly Bears are sensitive to human activity, but some individuals can habituate to predictable behaviours. In a few situations, habituation could be seen as positive, such as the very closely regulated viewing of brown bears at McNeal River Falls in Alaska.

Unfortunately, the more typical situation is that human activity is not well regulated, and in these cases habituated bears can become unpredictable and potentially dangerous. If the habituated bears are also food-conditioned, then the risk to human safety increases significantly.

Grizzly Bears are also negatively affected by motorized vehicle use, although this topic is less well studied on trails with varying levels of human use. As the level of use increases, so does the negative effect. Vehicular traffic along open roads can displace grizzly bears from 100-900m.

Even where female grizzlies use areas near roads and settlements, presumably to avoid males that are less tolerant of human activities, these sows often become habituated, food-conditioned, and are eventually relocated or destroyed. Habituation can also occur when bears feed on improperly handled garbage.

The objective of commercial recreation guidelines for Grizzly Bear is to maintain the current distribution and abundance of provincial populations and prevent the habituation of Grizzly Bears to humans and human activities.

Bear viewing guidelines (abridged)

Bear Viewing Guidelines directly quoted from *Commercial Recreation on Crown Land - Guidelines for Staff and Applicants.* Full guidelines are available at:
http://www.bc-land-assets.com/CLB/pdf__files/crguide.pdf

Wildlife viewing provides excellent opportunities to promote the appreciation of wildlife and habitat conservation. Bears, in particular, have broad public appeal and are popular for viewing purposes. Despite this, the conservation of bears must remain the primary objective of all bear management and cannot be compromised to increase viewing opportunities. Bears, particularly grizzlies, are already facing stresses from a variety of sources including habitat loss, fragmentation and alienation. To compound these current impacts with the additional stress of a human presence, often at prime feeding locations, may be unacceptable in some locations.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Viewing programs in some areas have led to the displacement of individuals, particularly adult males who are generally resistant to habituation. However, whether this impacts bears at the population level is difficult to measure and has not been well studied. The potential for impact on bear populations is thought to vary depending on whether the bears congregate at a point concentration, are found along linear habitats (usually a river with a salmon run) or are dispersed across several habitats. The nature and degree of human use is also a variable which must be considered in determining the appropriateness of each bear viewing program.

Hunting around bear viewing areas poses an ethical dilemma and can be quite controversial. Some degree of habituation is likely to occur for most bears using these sites, particularly at point and linear concentrations. Here, management objectives must be clearly set prior to the commencement of viewing. If hunting is desired, viewing programs should avoid habituation and separate seasons set for both activities.

As with any backcountry enterprise, commercial operators must ensure a reasonable level of safety for their clients. Therefore, visitors should be given an overview of bear behaviour, food and waste management and how to react in the event of a bear encounter prior to any viewing event.

Considerations in Reviewing an Application Involving Bear Viewing

The main objective should be the conservation of bears. This must take precedence over all other objectives.

The impacts on bears of backcountry tourism both within and outside protected areas, and increased access, can be considerable, especially when they are cumulative. A major concern in the establishment of bear viewing opportunities is the stress placed on bears. This stress may alter behaviour resulting in displacement from prime habitat. This is particularly relevant because the best bear viewing opportunities occur at sites to which bears reliably return, usually due to a consistent food source, such as salmon. Not coincidentally, these areas represent prime habitat, usually with important food resources. Displacement from such resources may impact survivorship of some individuals, although such concerns are difficult to test and have not been well documented.

Viewing must not compound impacts currently faced by individual bears and bear populations in British Columbia.

Site-specific restrictions should be employed to mitigate potential impacts on bears. These include, but are not limited to:

- Visitor number restrictions. Optimal group size is determined by various on-site factors including topography, ability to build blinds and proximity to the bears.
- Distance restrictions. Viewers should be required to maintain a maximum distance from bears for their own safety and to reduce stress on the bears, e.g., in Khutzeymateen Provincial Park, viewers are required to maintain at least 150 m from the bears.
- Seasonal restrictions. Bear viewing should be restricted to set seasons, which should be determined on a site-specific basis. Seasonal viewing restrictions will help reduce conflict with hunting activities and allow bears time at critical food sources (e.g., salmon runs, berry patches) without human disturbance.
- Access restrictions. Bears should be left an option to feed without human observation. There is also concern regarding potential impacts from helicopter and fixed-wing overpasses for viewing purposes as well as jet-boat tours. The potential disturbance of such activities on bears is unknown and requires further investigation. Should such access methods be shown to be disruptive, they should be abandoned in favour of more benign viewing programs.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: MAMMALS

Areas with high potential for impacting bear behaviour should not be considered as suitable commercial viewing operations.

All commercial bear viewing should be led by a licensed guide with requisite training in bear behaviour, local ecology, ethics and conservation, pertinent regulations, first aid and a primer on tourism service to ensure a quality product is offered.

Commercial viewing operations provide excellent interpretive opportunities to educate the public about bear behaviour, ecology and conservation. Such knowledge may help reduce the number of backcountry confrontations and subsequent need to remove "problem" bears. All bear viewing operations should be required to develop an interpretive program to supplement the viewing experience.

Bear viewing seasons should not coincide with bear hunting seasons.

Whenever habituation of bears is observed, hunting should be discontinued within the radius of an average home range for an adult female (grizzly or black bear depending on the species present) from the viewing site.

Human safety should be paramount in day-to-day operations. Although managing bear populations should be the primary objective at bear viewing sites, visitor safety should be paramount in terms of day-to-day operations. These priorities require that visitation be cancelled in the event of an unstable situation with a potential "problem bear".

Prior to any viewing event, all visitors should be given a thorough overview on bear behaviour, acceptable human behaviour, food and waste management and proper reactions to close encounters with bears.

A hazard/risk assessment should be completed for all trails advertised for public bear viewing.

Landfills are not acceptable locations for bear viewing. Food or garbage conditioned bears represent a risk to human safety. In addition, the interpretive value of observing bears at landfills is very low; it may in fact be negative. More than 800 black bears and over 50 grizzlies are destroyed annually due to bear-human conflicts, often as a result of bears having access to non-natural foods such as garbage.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Lynx

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect from harassment by humans	1.1	Ensure lynx do not have access to human supplied foods by storing food and garbage in lynx proof containers.	1.1.1	No unnatural behaviour
		1.2	Maintain good sanitation of all transportation routes and snowmobile trails.		
		1.3	Regulate human activities so that they occur in a predictable fashion within defined areas to decrease flight responses. Where human-activity occurs on winter ranges, keep it concentrated in established areas to encourage habituation.		

Lynx

Key issues of concern: winter range, natal den sites

Principal sources of information:

Claar, J. J., Anderson, N., Boyd, D., Cherry, M., Conrad, B., Hompesch, R., Miller, S., Olson, G., Pac, H. I., Waller, J., Wittinger, T., & Youmans, H. (1999). Carnivores. In G. Joslin & H. Youmans (Eds.), *Effects of recreation on Rocky Mountain Wildlife: A review for Montana* (pp. 7.1 - 7.63): Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society http://www.montanatws.org/7carn.pdf.

Olliff, T., Legg, K., & Kaeding, B. (1999). *Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment.* Yellowstone National Park, WY: Report to the Greater Yellowstone Coordinating Committee.

Studies are lacking on the impacts of backcountry recreational activities on lynx. Notwithstanding this lack, it is less likely that these activities will kill lynx, but more likely that they will have indirect affects that influence natality and survival. Recreational activities and their associated infrastructure will likely reduce the amount of suitable habitat available to lynx in two major ways. First, buildings and travel routes may destroy and fragment habitat. Second, lynx may avoid otherwise suitable habitat because of unfamiliar sights, sounds and smells associated with human activity. This avoidance reduces habitat effectiveness, which in turn, could reduce hunting success and so reduce food intake. Taken to extreme situations, this could lead to reproductive failure or reduced litter sizes, or increased levels of mortality among kittens.

Snowmobiling appears to be the source of major concern in literature reviews. Reasons for this concern include: "this activity occurs when animals are frequently in poor condition… this activity can be dispersed on the landscape…it may occur at night when lynx are usually active…it is frequently accompanied by human disturbance and habitat loss…it may alter the density and distribution of snowshoe hares, a favored prey item." (Halfpenny et al. 1999).

Non-motorized recreational activities may also adversely impact lynx because these activities are typically dispersed and unpredictable (from the lynx's perspective). The absence of repetitive, predictable activities reduces the likelihood that lynx become habituated to it (Lynx appear to habituate more readily to motorized vehicles on roadways). Conversely, lynx do become habituated to human activity around sources of food such as garbage dumps.

Biologists recommend that a cumulative effects approach be taken when assessing impacts of recreation on lynx, but note that such studies have yet to be undertaken.

The objective of commercial recreation guidelines for Lynx is to maintain the current distribution and abundance of provincial populations.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Mountain Goat

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain the natural population	1.1 [M]	Identify, map and designate seasonal mountain goat habitats by compiling existing information and/or conducting an inventory. Operator to be familiar with seasonal mountain goat habitat.	1.1.1	Natural distribution and habitat sensitivity documented
			Apply Ungulate Winter Range guidelines.		
2.0	Avoid harassment	2.1	Maintain seasonal no-fly zones for helicopters and fixed-wing aircraft that are a minimum 2000 m horizontal and vertical distance from designated goat habitats unless goats are separated by a physical barrier that would minimize disturbance levels (e.g. mountain ridge or terrain block).	2.1.1	No disruption to natural behaviour patterns
		2.2	Select heli-ports, heli-pads and heli-spots for all helicopter activities to avoid locations within 2000 m of designated Mountain Goat habitat.	2.2.1	No disruption to natural behaviour patterns
		2.3	Avoid all human disturbance of identified kidding areas between May and June. Helicopters should not operate within 2000 m of goats during this period.	2.3.1	Successful kidding and natural behaviour patterns maintained
		2.4	Avoid all human disturbance of designated winter ranges between November and April by directing activity away from these areas	2.4.1	
		2.5	All non-motorized access trails and Mountain Goat viewing areas should be at least 300 m away from sensitive sites such as mineral licks and kidding cliffs.	2.5.1	
		2.6	Train staff and clients on responsible behaviour near critical seasonal Mountain Goat habitats.	2.6.1	
		2.7	Implement aircraft operating procedures/ flightlines (within and en-route to tenure area) to avoid disturbance of mountain goats when they are known to be using designated habitats		
3.0	Maintain habitat quality	3.1	Prevent development of facilities in or near high use habitats.	3.1.1	Critical habitats maintained

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Mountain Goat

Key issues of concern: human presence, especially in helicopters and snowmobiles.

Principal sources of information:

Cote, S. D. (1996). Mountain goat responses to helicopter disturbance. *Wildlife Society Bulletin, 24*, 681-685.

Foster, B. R., & Rahs, E. Y. (1983). A study of canyon-dwelling mountain goats in relation to a proposed hydroelectric development in northwest British Columbia, Canada. *Biological Conservation, 33*, 209-228.

Frid, A. (1997). *Human disturbance of mountain goats and related ungulates: a literature-based analysis with applications to Goatherd Mountain* (Unpublished report). Haines Junction, YK: Kluane National Park Reserve.

Penner, D. F. (1988). Behavioural response and habituation of Mountain Goats in relation to petroleum exploration at Pinto Creek, Alberta. *Biennial Symposium of the Northern Wild Sheep and Goat Council, 6*, 141-158.

Wilson, S. F., & Shackleton, D. M. (2001). *Backcountry Recreation and Mountain Goats* (Wildlife Bulletin B-103). Victoria: BC: Ministry of Environment, Lands and Parks. http://wlapwww.gov.bc.ca/wld/documents/b103.pdf

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-36.htm

Of all the ungulate species, mountain goats appear the most sensitive to disturbance, especially by helicopters. In Montana, increased disturbance by helicopters reduced productivity of mountain goats. In the Rocky Mountains of Alberta, mountain goats moved in response to helicopters from a distance of at least up to 1.5 km. In northern British Columbia, a study indicated that goats required a buffer area of 2 km to completely avoid harassment. A variety of reports recommend that helicopters should maintain a minimum of 2 km horizontal distance to avoid disturbance to mountain goats.

While the guidelines call for a minimum 2 km horizontal and vertical separation from goats and goat habitat, these distance interval restrictions may be relaxed by ameliorating circumstances (e.g. safety concerns due to weather)

The response of mountain goats to people, traffic and noise has also been examined in summer and in winter. In summer, goats can tolerate foot and vehicular traffic, "if they are gradually acclimatized and negative associations are avoided" (Penner 1988), especially if the activity is localized and highly predictable, but do not appear to habituate to sudden, unpredictable stimuli such as aircraft over flights or predators. Penner reported that Mountain Goats accepted indirect, persistent noise (i.e. generator noise) but showed alarm responses to aircraft.

An extensive problem analysis, literature review, and research program on human disturbance of Mountain Goats has been completed by Wilson and Shackleton.

The objective of commercial recreation guidelines for Mountain Goat is to maintain the current distribution and abundance of provincial populations.

Rodents: Red- and Blue-listed species

Cascade Mantled Ground Squirrel (BLUE), Great Basin Pocket Mouse (BLUE), Least Chipmunk – *orocetes* ssp. (BLUE), Least Chipmunk – *selkirki* ssp. (RED), Meadow Jumping Mouse – *alascensis* ssp. (BLUE), Mountain Beaver - *rainieri* ssp. (BLUE), Mountain Beaver – *rufa* ssp. (RED), Northern Bog Lemming – *artemisiae* ssp. (BLUE), Northern Pocket Gopher – *segregatus* ssp. (RED), Red-tailed Chipmunk – *ruficaudus* ssp. (RED), Red-tailed Chipmunk – *simulans* ssp. (BLUE), Southern Red-backed Vole – *galei* ssp. (BLUE), Southern Red-backed Vole – *occidentalis* ssp. (RED), Townsend's Vole – *cowani* ssp. (RED), Western Harvest Mouse (BLUE)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0 [M]	Identify the home range of these species	1.1	Identify all occurrences of this subspecies	1.1.1	Occurrences known
2.0	Protect from human harassment	2.1	Protect known population through training of staff and clients since these species are often treated as pests	2.1.1	Natural behaviour maintained
3.0	Natural high quality habitats maintained	3.1	Maintain sensitive habitats and the natural distribution of important habitat features (e.g. Coarse Woody Debris).	3.1.1	Natural distribution maintained

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened

Rodents: Red- and Blue-listed species

Key issues of concern: breeding and foraging habitats

Principal sources of information:

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia.* Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca), Inventory Number 605.

Hickman, G. R., Dixon, B. G., & Corn, J. (1999). Small mammals. In G. J. a. H. Youmans (Ed.), *Effects of recreation on Rocky Mountain Wildlife: A review for Montana.* (pp. 4.1-4.16): Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society http://www.montanatws.org/pages/page4.html.

For distribution and map of Mountain Beaver, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species sp ecies-29.htm

Red- and Blue-listed rodents include 16 species and subspecies of mammals. Most are small, such as chipmunks, voles, lemmings and mice, and they occupy a wide range of habitats from sea level to alpine and from shrub-steppe to evergreen forests. It is difficult generalize about the impacts of backcountry recreation for such a diverse group of animals, so the appropriate course of action is to first identify which species likely occur in the area of activity. The next logical step is to then determine the critical needs of those species present, and then develop specific guidelines to minimize or prevent impacts.

Notwithstanding the need for a site- and species-specific approach, Hickman offers some useful general considerations:

- In alpine habitats, small rodents can be affected by even minor levels of human use due to the ecological sensitivity of these high elevation ecosystems. Local extinctions can be serious because alpine species are often isolated from each other, given the discontinuous distribution of alpine areas especially in the southern half of the province.
- In bog habitats, snowmobiles and other off-highway vehicles (OHVS)s can damage bog vegetation that could degrade habitats for some species. Trails and roads that divert or modify drainage also can seriously degrade bog habitats.
- Snow cover is important to the winter survival of many rodents and snow compaction by snowmobiles can markedly increase the mortality of some small mammals.

The objective of commercial recreation guidelines for Red- and Blue-listed rodents is to maintain their current distribution and abundance in the province.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Sea Otter *(Blue)*

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Identify the home range of this species	1.1	Identify and map colonies, aggregations and feeding areas	1.1.1	Existing range known
		1.2	Document and report any known occurrences of Sea Otters	1.1.2	Occurrences known
2.0	Avoid disturbance and displacement	2.1	Maintain a no motorized watercraft buffer zone of 200 m around colonies, aggregations and feeding areas	2.1.1	Species continues to use area
		2.2	Maintain no-fly zones for helicopters and fixed-wing aircraft that are a minimum of 200 m horizontal and vertical distance from colonies, aggregations and feeding areas		
		2.3	No human recreational activity within 100 m of colonies, aggregations and feeding areas.		
		2.4	Prevent facility development within 2000 m of colonies, aggregations and feeding areas		
		2.5	Train staff and clients in appropriate behaviour in the vicinity of Sea Otters and their habitats	2.1.2	Knowledgeable staff ensure species protected from human disturbance

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Sea Otter

Key issues of concern: colonies, aggregations and feeding areas

Principal sources of information:

Blood, D. A. (1993). *Sea otter* (Wildlife in British Columbia At Risk). Victoria, BC: Ministry of Environment, Lands and Parks. Available at http://wlapwww.gov.bc.ca/wld/index.html

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/), Inventory Number 605

Sea Otters are considered Endangered under the BC Wildlife Act, and the Committee on the Status of Endangered Wildlife in Canada has listed the Sea Otter as Threatened. Heavily exploited for their fur, they were extirpated from Canada by 1911. Reintroductions from 1969-72 have resulted in small (<1000 animals), but growing, populations off the west coast of Vancouver Island and at the Hakai Provincial Recreation Area off the central coast of British Columbia. Their preferred habitat is kelp beds in shallow coastal waters with abundant prey such as sea urchins, abalone, crabs and other molluscs.

Otters are sensitive to oil pollution in marine waters: the Exxon Valdez disaster in southeast Alaska killed nearly half of the sea otters in the affected parts of Prince William Sound.

The objective of interim commercial recreation guidelines for Sea Otter is to maintain the current distribution and abundance of provincial populations.

Sheep

Rocky Mountain Bighorn, California Bighorn, Stone's and Dall's **(BLUE)**

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect the population	1.1[M]	Identify and map sensitive sites, including escape terrain, lambing habitats, mineral licks and winter ranges. Assign ratings of high and moderate sensitivity.	1.1.1	Critical habitats known
2.0	Protect sheep from harassment	2.1	Seasonally close highly sensitive habitats to snowmobiles and off-highway vehicles (OHVs).	2.1.1	No human caused disturbance during lambing period
		2.2	Regulate snowmobile and OHV activities within moderate sensitivity areas as needed.	2.2.1	No human caused sheep disturbance
		2.3	Limit helicopter and fixed-wing flight altitudes to a minimum of 500 m over designated sheep habitats and a minimum 1000 m horizontal distance from designated sheep habitats.		
		2.4	For sensitive sites, maintain a 2000 m horizontal separation from flight lines. Distance intervals may be relaxed by ameliorating circumstances (e.g. safety concerns because of weather).		
		2.5	Select heli-pads, heli-ports and heli-spots to avoid locations within 2000 m of designated sheep habitats.		
		2.6	Prevent facility development on or near critical seasonal wild sheep habitats.		
		2.7	All access trails and viewing areas should be at least 300 m away from sensitive sites.		
		2.8	Train staff and clients on responsible behaviour near sheep and sheep habitats.		

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Bighorn Sheep (California & Rocky Mountain) and Thinhorn Sheep (Dall's & Stone's)

Key issues of concern: low and high elevation winter ranges, lambing grounds, and mineral licks.

Principal sources of information:

Bleich, V. C., Bowyer, R. T., Pauli, A. M., Nicholson, M. C., & Anthes, R. W. (1994). Mountain sheep (Ovis canadensis) helicopter surveys: ramifications for the conservation of large mammals. *Biological Conservation, 70*(1-7).

Geist, V. (1978). Behaviour. In J. L. Schmidt & D. L. Gilbert (Eds.), *Big game of North America - Ecology and management* (pp. 283-296). Harrisburg, PA: Stackpole Books.

Krausman, P. R., & Hervert, J. J. (1983). Mountain sheep responses to aerial surveys. *Wildlife Society Bulletin, 11*, 372-375.

Legg, K. L. (1998). A review of the potential effects of winter recreation on bighorn sheep. *Biennial Symposium of the Northern Wild Sheep and Goat Council, 11*(14-19).

Paquet, M. M., & Demarchi, R. A. (1999). *Stone's Sheep of the northern Rockies: the effects of access*. The Foundation of North American Wild Sheep and Guide-Outfitters Association of British Columbia..

For distribution and map, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-33.htm

Wild sheep seem more sensitive to human activities than forest dwelling ungulates, as might be expected from a species living in open habitats. In addition to habitat needs generally described for hoofed mammals, wild sheep have additional needs for steep cliffs which serve as escape terrain and as safe places for lambing. Recreational activities that prevent wild sheep from accessing escape terrain or increase time spent in these areas probably increases stress, and may lower foraging efficiency. Operators need to be familiar with such sites in the tenured area

Human activities that stress Mountain Sheep include viewing, helicopter and fixed-wing aircraft, vehicles, and domestic dogs. While occasional exposure to these activities likely has minimal effect on wild sheep, chronic exposure potentially reduces forage efficiency that, in turn, affects growth and survival. Chronic stress can also compromise the immune system in wild sheep, increasing their vulnerability to diseases.

One published report suggests a preliminary setback distance of 3.5 km to reduce helicopter disturbance of Dall's sheep in the Yukon. In the Todagin Mountain area, thinhorn sheep and mountain goats have abandoned the area within 4 to 5 km of the helicopter flight corridor used for mine development. A five-year research program in the Churn Creek area suggests Bighorn Sheep may be as sensitive to helicopter disturbance as Mountain Goats. Bighorns have been observed to flee from helicopters that are 1 to 2 km away. Helicopter activities associated with wildlife viewing could have even a greater impact, since there would be more of a tendency for operators to fly in for a "closer" look.

The objective of commercial recreation guidelines for Mountain Sheep is to maintain the current distribution and abundance of provincial populations.

Vancouver Island Marmot (Red)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Identify the home range of this subspecies	1.1	Identify and map all occurrences and report all sightings and known use areas	1.1.1	Occurrences known
2.0	Protect from human harassment	2.1	Prevent facilities development and high levels of human activity in identified critical habitats at all times of the year.	2.1.1	Natural behaviour maintained
		2.2	Prevent dogs from approaching within 500 m of occupied habitats	2.2.1	No dogs in occupied habitats
		2.3	Limit helicopter and fixed-wing flight altitudes to a minimum of 500 m over occupied marmot habitats. Prevent helicopter landings near known use areas	2.3.1	No human caused disturbance
		2.4	Avoid human recreational activities near occupied habitats during spring and summer when marmots are active	2.4.1	No human caused disturbance
3.0	Natural high quality habitats maintained	3.1	Maintain sensitive habitats and the natural distribution of important habitat features	3.1.1	Natural distribution maintained
		3.2	Train staff and clients on responsible behaviour near Vancouver Island Marmot habitats	3.2.1	Knowledgeable staff ensure no intrusions

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Vancouver Island Marmot

Key issues of concern: all currently and historically occupied habitats

Principal sources of information:

Bryant, A. A. (1997). *Updated status report on the Vancouver Island marmot (Marmota vancouverensis)*. Ottawa, ON: Committee on the status of endangered wildlife in Canada (COSEWIC), Canadian Wildlife Service.

Bryant, A., & Blood, D. A. (1999). *Vancouver Island Marmot* (Wildlife in British Columbia At Risk). Victoria, BC: Ministry of Environment, Lands and Parks. Available at http://wlapwww.gov.bc.ca/wld/index.htm

Janz, D. W., Bryant, A. A., Dawe, N. K., Schwantje, H., Harper, B., Nagorsen, D., Doyle, D., deLaronde, M., Fraser, D., Lindsay, D., Leight-Spencer, S., McLaughlin, R., & Simmons, R. (1998). *Revised National Recovery Plan for the Vancouver Island Marmot*. Ottawa, ON: Recovery of Nationally Endangered Wildlife (RENEW) Committee. Report available from the Canadian Nature Federation, Ottawa, ON.

For distribution and map of Vancouver Island Marmot, see:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/species/species-30.htm

The Vancouver Island marmot is among the world's most rare mammals: fewer than 100 individuals exist in the wild. These marmots live in small colonies in steep, unforested patches at or just below treeline on Vancouver Island.

Marmots are hibernators. They emerge from their winter dens in May, give birth to litters in June and enter hibernation in September. Winter recreational activities appear to have no impact on marmot and there is no evidence that summer recreational activities affect marmots. Habitat changes resulting from ski developments also appear to have minimal impact on marmots. In fact, one colony of marmots lives on a ski run at a popular Vancouver Island ski resort. Notwithstanding the lack of evidence that backcountry recreational activities adversely affect marmots, the extremely precarious state of the species means that any activities must be avoided. As noted by Bryan, "The potential exists that some marmot colonies could be "loved to death" by ecotourists, but I consider this risk to be small." Among the reasons cited for this statement is the fact that most marmot colonies are unpublicized, difficult to access and located on private forestry lands.

The objective of commercial recreation guidelines for the Vancouver Island Marmot is to maintain the current distribution and abundance of the world population in the province.

Wolverine (Blue)

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Protect critical habitats including denning sites	1.1	Report all sightings and known denning and high use sites. Maintain 2000 m buffer of non-use from known or suspected denning areas from mid February to May 30. Operator to be familiar with critical habitats and denning sites within the tenured area.	1.1.1	Observed critical habitats identified and protected; no abandonment of dens
		1.2[M]	Survey potential denning and high use sites	1.2.1	Potential critical habitats known
2.0	Protect species from human disturbance	2.1	Train staff and clients on responsible behaviour near sensitive wolverine habitats.	2.1.1	Knowledgeable staff ensure no intrusions and no poaching
		2.2	Avoid helicopter overflights and helicopter landings, heliskiing and snowmobile use near known den sites from mid February to May 30.	2.2.1	Natural behaviour and range maintained. No abandonment of den sites.
		2.3	Prevent facilities development and high levels of human activity in identified high use habitats at all other times of the year.	2.3.1	Natural behaviour and habitat maintained.

[M] = Strategy required for major development only

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Wolverine

Key issues of concern: natal den sites

Principal sources of information:

Cannings, S. G., Ramsay, L. R., Fraser, D. F., & Fraker, M. A. (1999). *Rare amphibians, reptiles, and mammals of British Columbia*. Victoria, BC: Wildlife Branch and Resources Inventory Branch, British Columbia Ministry of Environment, Lands and Parks. Available through Crown Publications (http://www.crownpub.bc.ca/) Inventory Number 605

Krebs, J. A., & Lewis, D. (2000). Wolverine ecology and habitat use in the North Columbia Mountains: progress report. In L. M. Darling (Ed.), *Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk* (Vol. 2, pp. 695-703). Victoria, BC: Ministry of Environment, Lands and Park.

Weaver, J. L., Paquet, P. C., & Ruggiero, L. F. (1996). Resilience and conservation of large carnivores in the Rocky Mountains. *Conservation Biology, 10*(4), 964-976.

Wolverines occupy large home ranges, and so they are likely to intersect winter recreational activities of many sorts, depending on the area. Winter is the critical period for wolverine and other carnivores, and so winter recreational activities can potentially affect wolverine in several ways, including disrupted foraging behaviour along groomed trails and other travel corridors, and displacement due to noise of snowmobiles or human presence. Wolverines seem to avoid human settlements. In the northern Columbia Mountains of British Columbia, national parks and unroaded wilderness areas receive high wolverine use, but pressures from commercial backcountry use, snowmobiling, and logging may jeopardize the ability of these high use areas to act as refugia for wolverine populations.

In late winter (Feb 15 – Apr 30), reproductive females establish natal dens in areas with little or no human disturbance, in non-forested habitats (avalanche debris or large blocky talus) of upper-elevation forested zones (e.g. Englemann Spruce- Subalpine Fir biogeoclimatic zone). Often these natal dens are in the same type of subalpine cirques that snowmobilers seek. Females with kits are extremely vulnerable to human disturbance and will abandon den sites if disturbed.

The objective of commercial recreation guidelines for Wolverine is to maintain the current distribution and abundance of provincial populations.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Exotic Pack Animals

including llamas, alpacas and domestic goats

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Prevent transmission of epidemic diseases	1.1	Prohibit the use of exotic pack animals in specifically designated areas with very high ungulate values and/or particularly sensitive populations (e.g. mountain sheep)	1.1.1	No disease epidemics in native ungulates
		1.2	On less sensitive ungulate ranges, confine travel of exotic pack animals to designated routes that prevent the potential for contact with native ungulates	1.2.1	
		1.3	Separate exotic pack animals from native ungulates temporally, for example, by allowing the use of winter ranges during summer	1.3.1	
		1.4	Keep exotic pack animals leashed and/or tethered at all times	1.4.1	
		1.5	Ensure all exotic pack animals are in good health prior to and during pack trips, and that if any illness occurs, that a veterinarian experienced with the species examines them. The examination should place particular emphasis on diagnosis for those parasites and infectious diseases potentially transmitted to wild ungulates, and any findings should be reported to the regional WLAP office	1.5.1	
		1.6	Train staff and clients on responsible behaviour with exotic pack animals on and near ungulate ranges	1.6.1	Knowledgeable staff prevent disease transmission

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Exotic Pack Animals

Key issues of concern: spread of introduced diseases

There are a variety of diseases and parasites that can infect and be carried by apparently healthy "exotic" pack animals (e.g. domestic goats, llamas and alpacas) that are capable of being transmitted to native ungulate populations with disastrous consequences. Most wild ungulate populations are immunologically naïve and are believed to have little natural resistance to organisms that are found in these domesticated species. Transfer between animals can result in illness of individual animals and has the potential to spread to a greater proportion of the wild population and become endemic. Many examples exist where disease organisms have transferred from domestic stocks to wild ungulates (e.g. brucellosis in elk, tuberculosis in white tailed deer, pasteurellosis in mountain sheep).

The objective of commercial recreation guidelines for "exotic" pack animals is to minimize their physical contact with native ungulates.

Interim Wildlife Guidelines for Commercial Recreation: **MAMMALS**

Ungulate[1] Winter Range

Last modified: March 2002

MANAGEMENT OBJECTIVE		IMPACT MITIGATION GUIDELINES		SUCCESS INDICATOR	
1.0	Maintain natural distribution of ungulates on their wintering range	1.1	For major projects, identify and map ungulate winter ranges and identify critical periods.	1.1.1	Winter ranges identified and mapped
2.0	Minimize stress caused by human disturbance	2.1	Avoid construction of facilities on designated ungulate winter ranges.	2.1.1	Minimal human caused disturbance
		2.2	Plan developments so there are buffer areas between humans and wintering ungulates, and create or maintain sight barriers, noise barriers and hiding cover between areas of human-use and winter ranges.	2.2.1	
		2.3	Locate transportation routes and snowmobile trails outside of critical winter ranges.	2.3.1	
		2.4	Where existing snowmobile trails intersect critical winter ranges, restrict snowmobiles to designated roads and trails, and prevent their use during critical periods.	2.4.1	
		2.5	Where proposed winter-use trails and roads are in close proximity (within 300 m) of important winter ranges, screen the routes behind ridgelines and vegetative cover	2.5.1	
		2.6	Establish, and enforce low speed limits (e.g. 40 kph) on roads and trails that are within 300 m of important winter ranges.	2.6.1	Few ungulate-vehicle collisions
		2.7	Restrict off road travel during critical winter periods.	2.7.1	
		2.8	If ungulates are traveling on plowed roads, ensure frequent escape breaks are created in the bermed snow to allow animals to exit the road to avoid vehicular traffic.	2.8.1	

[1] **Ungulate** A group of terrestrial mammals that are characterized by the presence of hooves. There are 9 species of native ungulates in British Columbia, Elk, Moose, Mule Deer, White-tailed Deer, Caribou, Bison, Mountain Goat, Bighorn Sheep, and Thinhorn Sheep

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC

BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

		2.9	Regulate human activities so that they occur in a predictable fashion within defined areas to decrease flight responses. Where human-activity occurs on winter ranges, keep it concentrated in established areas to limit disturbance impacts.	2.9.1	Minimal human caused disturbance
		2.10	Plan human use of ungulate winter ranges, including viewing distances to minimize flight responses as appropriate for different species present in the area.	2.10.1	
		2.11	Restrict human use of certain critical winter ranges during critical periods when there are indications that ungulates are being displaced either spatially or temporally by human presence.	2.11.1	
		2.12	Minimize and focus areas used for heli-skiing. Helicopter over-flights should meet the species specific avoidance criteria, unless these activities are separated from winter range habitat by a physical barrier that would minimize disturbance levels (e.g. a mountain ridge or terrain block). Distance interval restrictions may be relaxed by ameliorating circumstance (e.g. safety concerns because of weather).	2.12.1	
		2.13	Train staff and clients on responsible behaviour on and near ungulate winter ranges, including the leashing of pets to prevent chasing of wintering ungulates.	2.13.1	Knowledgeable staff ensure no intrusions
3.0	Maintain high quality winter and early spring habitats	3.1	Where the potential exists for competition for forage resources, manage livestock use of critical ungulate winter ranges to minimize impacts and improve range condition.	3.1.1	Winter and early spring forage resources are maintained

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Ungulate Winter Ranges

Key issues of concern: habitat degradation, additional stress on animals

Most of the concern about the effects of recreational activities on hoofed mammals is for the winter season, because animals are most vulnerable to adverse impacts at that time. During this season, ungulates are:

- Concentrated into smaller areas compared to other times of the year, so that any adverse activity or event is more likely to affect a greater number of individuals than at other seasons when they are more dispersed.
- In poorer physical condition because of nutritionally inadequate forage, and so are less able to cope with extra stresses and disturbances, both natural and human-caused.
- Exposed to increased energetic costs as a result of greater energy needs from inclement weather and the increased energy spent through locomotion in snow.
- Less able to disperse within their winter range because deep snow restricts or prevents their movements.
- Very limited in their choices of alternative habitats because deep snow and other physical factors precludes access to them.

The above conditions and factors apply to the entire winter season. However, toward late winter, the condition of wintering ungulates, suffering from increased energetic demands and decreased energy intake, will progressively deteriorate until they can be quite debilitated. The loss of condition and the resulting levels of over wintering mortality vary according to the severity and duration of tough conditions. In a severe winter on poor range, displacement of animals from even a small segment of their range may hurt the larger population.

Another critical season is the post-winter or early spring period. At this time, ungulates are at the lowest point in their annual cycle, and access to nutritious new forage is essential if individuals are to regain physical condition. Most adult females are in the last stages of pregnancy and preparing for birth and lactation. Energy demands are especially heavy, and nutritious forage is essential for their recovery, and for the successful birthing and rearing of newborns. Lactation is the most energy demanding time of the annual cycle for females.

If ungulates are exposed to excessive stresses over the winter, the effects are rarely observed immediately, for example, by the death of individuals. More typically, animals move away from a stress, such as winter recreationists and nothing more seems to happen. Of course, responses vary according to many factors such as type of activity, its proximity, its duration, and its frequency, but it is the cumulative incremental effects of these seemingly innocuous events that are of greatest concerns. Consequences of these impacts are often subtle, sub-clinical and delayed. They can occur in late winter early spring or during lactation – chronic stress can impair immune responses, animals lose weight and die of malnutrition, others are less able to escape predators or withstand disease, females abort fetuses, or newborns fail to thrive because of inadequate milk supplies or interrupted maternal care.

By their very nature, these types of cumulative impacts are difficult to document. Studies of ungulate response to recreational activities commonly measure behavioural changes, such as movements by animals when exposed to different activities at varying distances. The energy costs of these responses can be determined by extrapolating from studies of ungulate locomotion. Other studies have used heart rate to monitor ungulate responses because there is a strong correlation between heart rate and metabolic costs.

Another consideration is that there are only limited areas that meet the habitat requirements of ungulates for winter range. Although each species has its own requirements for winter habitat, in most

cases winter range is limiting. Consequently, recreational activities that reduce the physical extent of winter habitat place an additional demand on animals.

The objective of commercial recreation guidelines for ungulates on their winter ranges is to minimize stress and other adverse effects due to human activities. The aim is to design and plan Commercial Recreation facilities and operations to minimize impacts on ungulates on their winter range.

Refer to species specific guidelines for Mountain Sheep, Bison, Caribou, and Mountain Goat.

Interim Wildlife Guidelines for Commercial Recreation in British Columbia

Chapter 5

PLANT COMMUNITIES AND HABITATS

Liard River Hotsprings Provincial Park
Photo: Gail Ross

BRITISH COLUMBIA

Ministry of Water, Land and Air Protection
May, 2002

Biodiversity Branch
Ecosystem Planning and Standards Section
Email: Ecosystem.Planning@gems3.gov.bc.ca

Table of Contents

General Guidelines for All Species	2
Riparian Areas and Sensitive Wetlands	4
Wildlife Trees and Coarse Woody Debris	6
Alpine Meadows	8

Interim Wildlife Guidelines for Commercial Recreation: **Plant Communities and Habitats**

General Guidelines for All Species

Last modified: March 2002

MANAGEMENT OBJECTIVE		STRATEGY (Client)		SUCCESS INDICATOR	
1.0	Protect wildlife from human disturbance	1.1	Within tenures, place new developments within or immediately adjacent to existing developments or facilities so that human impacts are clustered	1.1.1	No human caused disturbance
		1.2	Avoid noisy, intrusive, or otherwise potentially harassing human activities during periods of the year when wildlife are under severe environmental and physiological stress, in particular during the winter survival and spring natality periods. Direct and deliberate harassment is never acceptable.	1.2.1	No human caused disturbance
		1.3	Humans should not feed or approach wildlife closer than 20 m, even habituated individuals	1.3.1	No human caused disturbance
		1.4	Control livestock and pets to minimize harassment and displacement of wildlife		
		1.5	Train staff and clients to increase awareness on appropriate behaviour in wilderness settings to minimize potential for human disturbance	1.4.1	Knowledgeable staff and clients ensure minimal disturbance
2.0	Maintain wildlife habitat values	2.1	Carefully consider future and existing activities to avoid disturbing or removing important habitats. Be aware of potential implications such as alteration of animal movement patterns, displacement of animals from key habitats, and destruction of homesites and other habitat features.	2.1.1	Wildlife habitat values maintained
		2.2	Minimize the use of pesticides and herbicides and other chemicals that may contaminate the environment and impair healthy ecosystem functions	2.2.1	No ecosystem contamination
3.0	Improve mitigation guidelines	3.1	Initiate wildlife monitoring programs, under the direction of a professional biologist, and with the approval of WLAP's wildlife program, to modify guidelines to be more area and user specific	3.1.1	Guidelines modified and improved to reflect local circumstances

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened

Interim Wildlife Guidelines for Commercial Recreation: **Plant Communities and Habitats**

GENERAL GUIDELINES FOR ALL SPECIES

The objective of commercial recreation guidelines for all species is to maintain current distribution and abundance of wildlife resources within the project area.

Information on seasonal habitat use, migration routes, natality areas, and timing of animal activities is important to effectively mitigate impacts of commercial recreation on wildlife populations. User initiated wildlife monitoring programs, under the direction of a professional biologist, and with the approval of WLAP's Environmental Stewardship Branch, could be used to modify guidelines to be more area and user specific.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Plant Communities and Habitats**

Riparian Areas and Sensitive Wetlands

Last modified: March 2002

MANAGEMENT OBJECTIVE		STRATEGY (Client)		SUCCESS INDICATOR	
1.0	Minimize habitat disturbance in riparian zone.	1.1	Locate main facilities outside riparian zone. If necessary, limit facility development to the minimum required to achieve development purpose through careful planning and site location.	1.1.1	Small ecological footprint of development
		1.2	Avoid road development and limit trail development in riparian zone.	1.2.1	Km of roads and trails in riparian
		1.3	Train staff and clients on responsible behaviour near sensitive lakes and streams.	1.3.1	
		1.4	Minimize the number of creek crossings, cross as right angle to the water flow where possible, and where practical use bridge instead of fording	1.4.1	Number and type of creek crossings
		1.5	Minimize use of snowmobiles on or near sensitive wetlands and riparian areas	1.5.1	Minimal damage to vegetation or water quality

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Riparian Ecosystems and Sensitive Wetlands

Primary sources of information:

Environmental Trends in British Columbia. (2000). Victoria, BC: BC Ministry of Water, Land and Air Protection. Available at: http://wlapwww.gov.bc.ca/soerpt/14-1-riparian-ecosystems.html

Andrews, A. K., & Auble, G. T. (1995). Riparian Ecosystems. In E. T. LaRoe & G. S. Farris & C. E. Puckett & P. D. Doran & M. J. Mac (Eds.), *Our Living Resources: A Report to the Nation on the Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecosystems* (pp. 530). Washington, DC: National Biological Service. Available at: http://biology.usgs.gov/s+t/pdf/Riparian.pdf

Egan, B., Cadrin, C., & Cannings, S. (1997). *Cottonwood Riparian Ecosystems of the Southern Interior* (Ecosystems in British Columbia At Risk). Victoria, BC: Ministry of Environment, Lands and Parks. Available at http://wlapwww.gov.bc.ca/wld/documents/cottonwood.pdf

Riparian ecosystems are those areas adjacent to watercourses, a transition zone between upland and aquatic ecosystems. The defining feature of the riparian environments is close proximity to water. In the drier parts of the province, the riparian zones are often the only places moist enough to support the growth of trees and shrubs. In much of the province, riparian zones are subject to flooding during spring runoff and winter rains.

Riparian ecosystems cover only a small portion of the forest land in a watershed, but because they are often more diverse and productive than upland areas, they provide critical wildlife habitat.

Forest riparian ecosystems have an important role in stabilizing streambanks, regulating stream temperature and filtering out potentially harmful debris and pollutants. They produce a high diversity of plant species, which provide many opportunities to wildlife for nesting, feeding, hiding, roosting and use as migration corridors.
Forest riparian ecosystems also are a source of large woody debris that falls into streams, providing structural stability, complexity and nutrients to aquatic ecosystems.

Necessary permits and/or licences with specific legal conditions related to water for road and trail development, commercial water use, sewage disposal, and water diversion for hydroelectric power development must be obtained.

The objective of these commercial recreation guidelines is to minimize disturbance of riparian ecosystems and sensitive wetlands, and to further reduce the risk of water sedimentation or contamination.

Interim Wildlife Guidelines for Commercial Recreation: **Plant Communities and Habitats**

Wildlife Trees and Coarse Woody Debris

Last modified: March 2002

MANAGEMENT OBJECTIVE		STRATEGY (Client)		SUCCESS INDICATOR	
1.0	No unauthorized cutting of trees on Crown Land	1.1	Prevent unauthorized cutting of trees on Crown Land. Obtain a permit to cut trees for clearing, construction or firewood from Ministry of Forests.	1.1.1	Permits obtained
2.0	Maintain the natural supply of large standing dead trees for wildlife	2.1	Avoid cutting standing dead trees over 10 cm in diameter except as necessary for development or for safety reasons within planned development area	2.1.1	Natural supply of wildlife trees outside planned development area
3.0	Maintain the natural supply of large fallen trees as coarse woody debris for wildlife	3.1	Avoid disturbance or removal of fallen trees over 10 cm in diameter except as necessary for development or safety reasons within planned development area	3.1.1	Natural supply of coarse woody debris outside planned development area.

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC.
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Plant Communities and Habitats**

Wildlife Trees and Coarse Woody Debris

For more information, see:
Rotten Luck: The Role of Downed Wood in Ecosystems [pamphlet]. BC Ministry of Forests.

http://www.for.gov.bc.ca/hfd/pubs/Docs/Bro/bro24.pdf

Wildlife Trees of Firewood? BC Ministry of Forests.
http://www.for.gov.bc.ca/hfp/pubs/wildlife_trees/Fire.pdf

Wildlife Trees & Coarse Woody Debris Publications And Products, BC Ministry of Forests

http://www.for.gov.bc.ca/hfp/Pubswildlifetrees.htm

The importance of wildlife trees (what used to be called 'snags' or 'dead standing trees') and coarse woody debris (also called 'downed wood') in the conservation of biodiversity cannot be underestimated.

More than 80 species of wildlife in BC, many of which are on the various Red and Blue species lists, make their homes in wildlife trees or fallen, rotting wood. These species include:

Primary cavity excavators – birds, such as woodpeckers, sapsuckers, nuthatches and chickadees excavate their own nest holes in trees.

Secondary cavity users – species such as owls, salamanders and squirrels which cannot excavate their own cavities but rely on natural cavities or abandoned nest holes for nesting and denning sites, shelter and food storage.

Downed wood is a "savings account" of nutrients. As downed wood decays, nutrients are recycled back into the soil. Fallen logs also stabilize soils and reduce erosion by wind, rain and melting snow.

As well as being a source of food and energy, downed wood may be a safe place to hide from predators, or to breed, or to shelter from heat, cold and storms. Loose bark and cracks in decaying wood are safe hiding places for salamanders, skinks, voles, shrews and shrewmoles. Hollow logs provide shelter for bears, raccoons, weasels, hares and woodrats. Amphibians, snakes, voles and mice burrow into well rotted, disintegrating logs to nest or hide, providing habitat. Large logs help stabilize stream channels and create a series of pools and rapidly flowing water. Some birds, such as harlequin ducks, use streamside logs for breeding sites.

Fallen logs are also excellent nurseries for plants. "Nurse logs" can provide greater warmth, longer snowfree periods, less competition from other plants, more moisture, and sometimes more nutrients than the surrounding forest. Soil and other organic matter that tend to gather uphill behind fallen logs also create rich, sheltered growing sites.

In estuaries, downed wood enriches the habitat for many species and along the coastline beached logs stabilize sand spits, beaches and dunes.

So while using dead or downed wood might look attractive as a source for firewood, it is best to leave it alone and use felled timber.

The objective of commercial recreation guidelines for coarse woody debris is to maintain the natural supply of large standing dead trees and large fallen trees as structural components of wildlife habitat.

Interim Wildlife Guidelines for Commercial Recreation: **Plant Communities and Habitats**

Alpine Meadows

Last modified: March 2002

MANAGEMENT OBJECTIVE		STRATEGY (Client)		SUCCESS INDICATOR	
1.0	Maintain natural vegetation	1.1	Avoid soil compaction so there is minimal evidence of vegetation change	1.1.1	Minimal evidence of vegetation change
		1.3	For light use areas promote random wear (move tents after 2 days use) so there is no identifiable trail, campsite or helipad development.	1.3.1	No identifiable trail and campsite development. Minimal evidence of vegetation change
		1.4	For medium level use, promote well planned trail routes which can sustain use with minimal erosion and vegetation loss and place campsites in locations which will minimize vegetation change as a result of tenting	1.4.1	Trail development evident only in planned locations. Camping evidence limited.
		1.5	For heavy use, confine use to designated trails and campsites that have been hardened with gravel or other well draining material	1.5.1	Evidence of use and vegetation change limited to developed facilities
		1.6	Minimize water diversion and channelling	1.6.1	Minimal evidence of diversion
		1.7	Limit ATV use to existing roads and well developed trails	1.7.1	No evidence of ATV use off roads and trails
		1.8	Place campsites and helipads in locations that will minimize vegetation change as a result of use		
2.0	Minimize impact of livestock grazing	2.1	Minimize impact of livestock grazing through an approved Ministry of Forests grazing plan with the necessary permits	2.1.1	Permits is place
		2.2	Disperse livestock use to avoid over use by concentration	2.2.1	Limited observable damage to native vegetation
		2.3	Limit stock use of water to avoid breakdown of small ponds and streams	2.3.1	Limited observable damage to streams and ponds

RED: Indigenous species or subspecies that have been legally designated or are being considered for legal designation as Extirpated, Endangered, or Threatened status in BC
BLUE: Indigenous species or subspecies considered to be Vulnerable in BC. They are at risk, but not Extirpated, Endangered, or Threatened.

Interim Wildlife Guidelines for Commercial Recreation: **Plant Communities and Habitats**

Alpine and Subalpine Meadows

Primary source of information:
Pojar, J., & Stewart, A. C. (1991). Alpine Tundra Zone. In D. Meidinger & J. Pojar (Eds.), Ecosystems of British Columbia (pp. 263-274). Victoria, BC: BC Ministry of Forests. Available from: http://www.for.gov.bc.ca/hfd/pubs/docs/Srs/Srs06/chap18.pdf

The alpine areas of the province are found in high mountains above 2000 metres in the southeast, above 1650 metres. in the southwest, above 1400 metres in the northeast, and above 1000 metres in the northwest.

These regions are treeless or nearly so, and the flora is mainly shrubs, grasses and flowering plants, mosses and lichens. Soil is often thin or nonexistent, and easily damaged.

Natural process work slowly in this environment, and damage to habitat may take a long time to be naturally repaired.

The objective of these commercial recreation guidelines is to maintain natural vegetation and ecosystem function within alpine and subalpine meadows

Interim Wildlife Guidelines for Commercial Backcountry Recreation in British Columbia

Chapter 6

SOURCES OF HUMAN-CAUSED DISTURBANCE

Mt. Assiniboine Provincial Park
Photo: Wayne Stetski

BRITISH COLUMBIA

Ministry of Water, Land and Air Protection
May, 2002

Biodiversity Branch
Ecosystem Planning and Standards Section
Email: Ecosystem.Planning@gems3.gov.bc.ca

Interim Wildlife Guidelines for Commercial Recreation: SOURCES OF HUMAN-CAUSED DISTURBANCE

Introduction

Bringing visitors into the back-country is not without impacts. Both the presence of humans, and the means used to transport them into back-country environments, has an influence on wildlife and plant communities

Commercial recreation operators have the obligation to reduce their impact on the environment in which they bring guests and visitors. By behaving in a responsible manner, the guests will have an experience they will want to tell others about, the operator will have a continuous source of marketable opportunities, and wildlife will have the habitat that they need to flourish.

The material in these guidelines comes from two reports: *Access Management In British Columbia: A Provincial Overview (2001)*, available at http://wlapwww.gov.bc.ca/habitat/AccessReport(v6).pdf, and *Discussion Paper: Wildlife and Commercial Backcountry Recreation in British Columbia: Assessment of Impacts and Interim Guidelines for Mitigation*, available at http://wlapwww.gov.bc.ca/wld/pub/wcbrbc/harper_final_report_200007.pdf.

Roads

The physical nature of roads creates direct impacts on habitat, wildlife, and fisheries. Indirect effects are a result of encounters with people who travel into the backcountry on roads. Roads also increase the spatial extent of other activities by providing additional access to people exploring backcountry areas on off-road vehicles or with boats, bicycles, horses, skis, or on foot.

Effects of roads on wildlife can be classified into 2 categories: direct effects caused by the physical presence of a road (i.e., habitat loss, habitat fragmentation, barriers to movement), and indirect effects, caused by interactions with people travelling on roads.(i.e., collisions, hunting, poaching, animal control measures, harassment). Few species appear to be immune to the effects of roads. Species such as grizzly bears are particularly susceptible to road effects because of their low reproductive rates and the mortalities that inevitably result from confrontations with humans who travel into bear habitat on backcountry roads. Roads and access management are consistently cited as major factors influencing human-caused grizzly bear deaths.

Black bears, grizzly bears, and wolverines can also be displaced from areas near roads. Black bears avoid crossing roads with high traffic volumes, and may alter the location of their home ranges in response to high road densities.

Road crossings of bobcats are inversely related to traffic volumes. Cougars may avoid crossing improved dirt and hard surface roads. Wolves are generally restricted to landscapes with low road densities

Gray wolves suffer from the increase in human contact that accompanies road access. Most wolf mortalities are caused by humans, and most occur near roads. Increasing road densities are correlated with declining wolf populations

Roads are an important source of direct mortality for ungulates, including mountain caribou, mountain goats, bighorn sheep, moose, and deer species. Elk and deer avoid areas near roads, and avoidance increases with increasing traffic volumes

Smaller animals such as reptiles and amphibians typically suffer high rates of mortality as a result of roads, particularly those that actively use roads for heating and cooling, or species that commonly move

between wetland and upland habitats. Declines in the abundance of amphibians have been linked to road densities and traffic rates.

A large number of bird species avoid nesting, or suffer lower reproductive success, near roads. Roads fragment wildlife habitat, affecting movements and dispersal of several species.

Off-Road Access

Off-road access can be categorized as non-motorized (e.g. hiking, skiing, biking, horseback riding), all terrain vehicles (OHV's; including motorcycles), and snowmobiles. Most of the concern about off-road access has been related to motorized traffic; however, non-motorized impacts can be similar where traffic volumes are large. In general, the impacts of off-road access are much less than those created by a road network because roads create a greater (and often permanent) physical disturbance that conveys greater numbers of people engaged in a wider range of activities into the backcountry. However, off-road access can create extensive impacts that are spread widely on the landscape

Off-road access results in habitat modifications through disturbances to vegetation and soil, and through changes to microclimates. Impacts are greatest in alpine, bog, and arid areas. Wet-soil areas are at greatest risk of trampling by human foot traffic. Trampling can lead to plant community changes and can create favourable environments for invasion by exotic species.

Horses are more destructive to trails than humans on foot, and motorcycles are more destructive than horses on upslopes. The soil compaction, vegetation damage, and changes in community structure associated with ATV use can last decades or centuries. The habitat changes associated with off-road access create favourable environments for weed invasions, the seeds for which are carried by OHV's or in hay for horses.

Snowmobiling in wetland areas can effect the distribution and abundance of wetland vegetation. Compacting of snow by snowmobiles in any habitat lowers temperatures under the snow and reduces the over-winter survival of plants and soil microbes. In addition, compacting reduces the water-holding capacity of snow, leading to greater peak flows in spring.

Hunting is an obvious impact on wildlife that is facilitated by off-road access to the backcountry. Poaching often follows hunting; for example, hunters shoot wolves misidentified as dogs or coyotes, or they intentionally kill wolves. A major study reviewed the effects of non-consumptive outdoor recreation on wildlife and found them to be overwhelmingly negative. Many of the impacts are indirect; for example, domestic dogs accompanying humans into the backcountry can be significant vectors of disease for gray wolves.

The zone of influence of a hiking a trail may extend up to 100 m. Hikers can disrupt the normal behaviour of a variety of wildlife species. Harassment of ungulates can lead to increased metabolism, resulting in illness, reproductive costs, and death. Many studies have documented the displacement of ungulates from preferred habitat by recreation-related activities. Deer, moose, and elk react to cross-country skiers. Wolves and black bears may abandon dens disturbed by humans. In addition, habituation can be a serious problem with many wildlife species near hiking trails, particularly species that are dangerous to humans such as grizzly bears. Grizzly bears respond more strongly to humans on foot than to regular motorized traffic to which they have habituated.

Additional impacts occur when humans are on OHV's (Off-highway vehicles). Numerous studies have documented negative effects of OHV's on ungulates. OHV use along riparian banks and through wetlands may impact semi-aquatic mammals such as beavers, mink,

river otters, and muskrats.

The effects of snowmobiles on wildlife depend on how machines are operated and on the characteristics of snow cover and underlying habitats. Snowmobiles pack snow and reduce its insulating value, thus affecting the under-snow environment for small mammal. Snowmobile use on ice in winter may effect semi-aquatic mammals. Snowmobile trails can enhance the winter mobility of deer however, they also increase the mobility of predators such as wolves. Deer avoid trails frequented by snowmobiles, and increase their movements in response to relatively light traffic.

Water Access

Water access involves both motorized (e.g. propeller-driven and jet boats) and nonmotorized (e.g. canoes, kayaks) activities. Very few studies have addressed the effects of water access activities on habitats common in British Columbia; however, results of some studies from other jurisdictions are relevant.

Motorboats are associated with a number of impacts on aquatic habitats, including: shoreline erosion, water pollution, sediment resuspension, increased turbulence and turbidity, and damage to aquatic plants. Non-motorized boating can also be associated with high levels of aquatic pollution, mostly from related human activities. Boating and angling are significant vectors of exotic weed distribution

The general effect of water access on wildlife is related to the increase in human activity in backcountry areas that comes with the access opportunities. These effects range from increases in hunting pressure and harassment of wildlife, to vegetation changes. Some wildlife species are particularly susceptible to disturbances from boating activities, such as the harlequin duck, which nests in low densities on fast-flowing wilderness streams and rivers. Studies have repeatedly shown that nesting harlequin ducks are disturbed by the presence of humans, and that breeding densities decline with increases in recreational activities such as whitewater rafting. Common loon and ospreys are also considered to be sensitive to disturbance on and near water.

The most obvious effect of water access on fish is an increase in mortality associated with increased fishing pressure. In addition, boats or wading anglers may cause areas to be abandoned by fish or may reduce the breeding success of fish populations by driving guarding males off nests. Effects in shallow water are more severe than in deeper water.

Up to 30% of fuel used in two-stroke marine engines is discharged unburned into water. The effect of these discharges on aquatic organisms is poorly understood; however, there is compelling evidence that fish populations are affected by pollution associated with two-stroke engines.

Air Access

Access to the backcountry by helicopter or fixed wing aircraft falls into 2 categories: overflights and flights involving landings. Obviously, the potential for impacts is greater when aircraft land. Impacts of overflights are generally restricted to harassment of wildlife. The effects of helicopter and floatplane landings on terrestrial and aquatic habitats are minimal.

The effect of air access on fisheries is generally restricted to the effect of increased fishing pressure that accompanies access into otherwise inaccessible areas. In British Columbia, these areas include high elevation lakes that have low natural productivity and are sensitive to fishing pressure.

Hunting pressure increases in remote areas where aircraft are used to

discharge hunters. Impacts of landings and overflights on wildlife are otherwise restricted to harassment. Landings generate more harassment events than overflights because aircraft make closer approaches to animals.

The response of ungulates to aircraft has been widely studied. Of particular management concern in British Columbia is the effect of overflights on mountain caribou and mountain goats. Overflights of caribou in Labrador by military aircraft have been shown to reduce calving success. No studies have yet linked demographic declines of mountain goats with aircraft overflights; rather, most studies have measured short-term behavioural reactions. Other ungulates have demonstrated varying responses to overflights by different aircraft, including: bighorn sheep, mule deer, and white-tailed deer. Effects of overflights on other wildlife species occurring in British Columbia are poorly documented.

Interim Wildlife Guidelines for Commercial Recreation: **SOURCES OF HUMAN-CAUSED DISTURBANCE**

	Road	Off-road	Water	Air
Access Related Activities	• industrial traffic • cars/trucks • off-road vehicles • non-motorized traffic	• ATVs • snowmachines • non-motorized traffic	• motorized watercraft • non- motorized watercraft traffic	• helicopters • fixed-wing aircraft
Habitat Impacts	• direct habitat loss • habitat fragmentation • reduced habitat effectiveness • loss of forest interior habitat conditions • human-induced fire • invasion by nonnative species • damage to soils & vegetation • spread of insects & disease	• invasion by non-native plants and animals • erosion and change in soil properties • human-induced fire • damage to soils and vegetation • spread of insects and disease	• biological invasions • riparian and wetland impacts • fuel deposits and spills	• industrial activities • fuel deposits and spills
Wildlife Impacts	• species displacement • barriers to movement and dispersal • reduced habitat use • harassment/poaching • reduced reproductive success • population fragmentation • hunting pressure • human/wildlife conflicts • problem wildlife control • habitat loss	• species displacement • barriers to movement and dispersal • reduced habitat use • harassment • poaching • reduced reproductive success • population fragmentation • hunting pressure • human/wildlife conflicts • problem wildlife control	• harassment • habitat avoidance • hunting pressure • poaching • animal control	• harassment • poaching
Fisheries Impacts	• sedimentation and altered stream flows • debris flows and landslides • introduce exotic species • restricted passages water quality • fishing pressure • riparian and wetland impacts	• sedimentation • fishing pressure • riparian and wetland impacts • stream bed and stream channel disturbances • introduce of exotic species	• water quality • fishing pressure • disturbance • fuel deposits and spills	• fishing pressure • fuel deposits and spills

Aircraft

Aircraft are used for a variety of commercial recreation activities, primarily for transportation to remote sites, but also for sightseeing and wildlife viewing. In some areas, helicopter access for the purposes of photography (production of feature films, documentaries, magazines, etc.) can be significant. For the purposes of this Guideline, aircraft are defined to include fixed-wing airplanes, helicopters, ultra light personal aircraft, hang-gliders, and balloons.

Potential recreational activities that employ the use of aircraft include:

- Helicopter access to remote locations
- Helicopter air tours
- Heli-skiing
- Heli-snowmobiling
- Heli-hiking
- Heli-biking
- Heli-fishing
- Heli-mountaineering
- Fixed-wing access to remote air-strips
- Fixed-wing air tours
- Fixed-wing glacier landings
- Floatplane landings on rivers, lakes, and marine waterbodies
- Ultra-light personal aircraft and para-glider flying
- Hang-gliding
- Hot air ballooning

Since aircraft disturbance of wildlife is primarily a function of how close and loud the aircraft is, helicopters are more disturbing than fixed-wing aircraft, which are more disturbing than ultra-light personal aircraft, hang-gliders, and balloons. Since ultra-light personal aircraft, hang-gliders, and balloons are quieter and slower, for the most part they should have relatively low impacts on wildlife.

Like other impacts, aircraft disturbance of wildlife becomes a serious issue when frequency of aircraft disturbance is high. Methods of mitigating the potential impacts of aircraft use on wildlife resources include:

- Restricting aircraft numbers, including spatial zoning,
- Ensuring and promoting more responsible behaviour of pilots,
- Scheduling aircraft traffic through site-specific habitat closures during breeding, nesting, denning and other sensitive periods,
- Encouraging aircraft with quieter engines to reduce harassment of wildlife.

Snowmobiles

Various types of snowmobiles are used for a variety of commercial recreation activities, including transportation to remote sites, and general touring and sightseeing. For the purposes of these Guidelines, snowmobiles are defined to include both personal snowmobiles and larger multi-person snow-cats.

Potential recreational activities that employ the use of snowmobiles include:

- Snowmobile access to remote locations
- Snowmobile tours
- Snow-cat skiing

In general, snowmobilers tend to ride at locations or higher elevations where there is more snow, so the impacts on ungulates that are intolerant of deeper snows, like bighorn sheep and deer, are sometimes less than on species that tolerate higher snow depths, like caribou and moose. However, even those species intolerant of deeper snow depths can be effected by snowmobiles. Species like Caribou and Wolverine are at particularly high risk in areas with widespread

alpine snowmobiling.

Packed trails established by snowmobile traffic moving through relatively deep snows separating low elevation winter ranges provide easy predator access routes between these winter ranges.

There is a great deal of low elevation snowmobile activity levels in most of the Province; not all snowmobilers seek out the deep snows found at higher elevation. In addition,

Potential impacts on wildlife from snowmobiling traffic include:

- Changes in animal behaviour, including abandonment of preferred habitat and distribution pattern changes,
- Additional stress from snowmobile disturbance, that potentially leads to decreased survival rates,
- Creation of packed trails into ungulate wintering areas, which can promote predator access to populations not displaced by the snowmobile activity,
- Damage to vulnerable soils and vegetation,
- The degradation of air and water quality due to dirty exhaust emissions from two-stroke engines. There is the potential of deposition of emissions in the snow pack and alteration of the water chemistry of streams and rivers due to hydrocarbons from incomplete fuel combustion.

Recent advances in the power and performance of snowmobiles means that even intermediate "sledders" can potentially access remote and rugged areas. Today's high-performance snowmobiles have engines that can generate more than 170 horsepower. Some US studies show the sport of snowmobiling growing at 20 percent a year.

Methods of mitigating the potential impacts of snowmobile use on wildlife resources include:

- Restricting snowmobile numbers,
- Ensuring and promoting more responsible behaviour of snowmobile operators,
- Seasonal closures of sensitive areas,
- Scheduling snowmobile traffic through site-specific habitat closures during breeding, nesting, denning and other sensitive periods,
- Scheduling snowmobile traffic to ensure snow cover is sufficient to prevent damage to vegetation,
- Encouraging cleaner snowmobile engines to reduce water and air pollution, and
- Encouraging quieter snowmobile engines to reduce harassment of wildlife.

Off-Highway Vehicles (OHVs)

Various types of motorized, off-highway vehicles are used for commercial recreational activities, including transportation to remote sites, and general touring and sightseeing. For the purposes of these Guidelines, off-highway vehicles are defined to include both personal all-terrain vehicles (ATVs) such as quads and trail bikes, as well as the larger four-wheel drive cars and trucks that are capable of transporting a number of individuals and their equipment.

Potential recreational activities that employ the use of OHVs include:

- OHV access to remote locations
- OHV touring

Similar to snowmobiles, technological advances have made it possible for OHVs to reach more and more remote terrain. Problems occur when OHVs stray from designated roads and paths and create their own trails; resulting in degradation of soil, water and vegetation. This is particularly problematic in sensitive habitats such as wetlands, grasslands and alpine/subalpine ecosystems. Increasing

use of OHV's also increases the potential for disturbing wildlife because their movements are not as predictable. Of major concern in some areas is the potential for OHV operations to inadvertently spread noxious weeds into new habitats.

The impacts of OHV on public lands in the United States are becoming bigger issues than they were a few years ago. For example, in Colorado, the U.S. Bureau of Land Management (BLM) has determined that a huge increase in ATVs, mountain bikes, sport utility vehicles (SUVs) and other four-wheel-drive vehicles since the 1980s has sliced up meadows, honeycombed mountainsides and crisscrossed open range in the 688,000 ha Grand Mesa, Uncompahgre and Gunnison National Forests of Colorado.

Methods of mitigating the potential impacts of OHVs use on wildlife resources include:

- Restricting OHV numbers, including zoning or area closures/restrictions, in sensitive areas.
- Ensure more responsible behaviour of OHV operators,
- Scheduling OHV traffic through site-specific habitat closures during breeding, nesting, denning and other sensitive periods, and
- Encouraging quieter OHV engines to reduce harassment of wildlife.

Personal Motorized Watercraft (PWC,) Jet Boats and Other High-Powered Boats

Various types of personal motorized watercraft (PWCs) are used for commercial recreation activities. Personal motorized watercraft (PWCs) are small vessels, usually less than 5 meters, which use an inboard motor to power a water jet pump for propulsion. Persons sitting, standing, or kneeling on the vessel operate them. Designed for speed and manoeuvrability, they are commonly referred to as jet skis, waverunners, wavejammers, wetjets, sea-doos, wetbikes, and surf jets.

Many personal watercrafts are powered by two stroke engines that cause significant air and water pollution. Jet skis are so polluting that the exhaust emissions from two hours of PWC operation is equivalent to the emissions from a 1998 passenger car operated for more than 100,000 miles. According to studies cited by the U.S. Environmental Protection Agency, two-stroke engines, like those used in PWCs, discharge 25 to 30 percent of their fuel unburned into the water. This type of pollution has the potential to have significant detrimental effects on aquatic species.

Methods of mitigating the potential impacts of PWCs and Jet Boats use on wildlife resources include:

- Restricting PWV and jet boat numbers in specific areas,
- Ensuring and promoting more responsible behaviour of PWV and jet boat operators.
- Scheduling PWV and jet boat traffic through site-specific habitat closures during breeding, nesting, denning and other sensitive periods, and
- Encouraging quieter PWV and jet boat engines to reduce harassment of wildlife.

Suggested ways of mitigating noise impacts of jet boats include:

- Eliminate the practice of returning river rafters to the original launch site by jet boat.
- Discourage boating in critical bird habitat during the peak months of July and August and redistribute the load to either before nesting or after the young birds have left the net and are no longer vulnerable.
- Reduce boat launchings and party sizes for both outfitter and private parties to reduce the vegetation damage along the river. Assign trip quotas to professional outfitters.

Interim Wildlife Guidelines for Commercial Recreation: **SOURCES OF HUMAN-CAUSED DISTURBANCE**

Mountain Bikes

The growth in mountain biking has resulted in environmental impacts in the back country. A variety of studies have indicated that trail erosion, soil compaction, trail widening and vegetation damage can occur but they can be avoided or minimised with appropriate trail siting, design and management.

Many studies note that the extent and severity of the physical impacts varied with soil characteristics, slope and climate as well as users.
Suggested ways of mitigating impacts of mountain biking include:

- maintaining a firm trail surface
- avoiding trail widening
- minimising erosion
- ensure good trail placement, design and management.
- Ensure appropriate soils that can withstand the impacts created by mountain bikes
- Avoid of steep downhill sections, especially if the trail is shared with walkers. Where steep downhills cannot be avoided or are desired, erosion prevention measures (e.g. water bars) should be included at the planning stage.
- Consideration should be given to the inclusion of curves, which could reduce the steepness of a slope and effectively reduce its length.

Backcountry Skiing

The numbers of backcountry skiers have grown 16 percent since the last White River National Forest plan was adopted, and backcountry ski huts have more than quadrupled. At the same time, some forest carnivores have been pushed to the brink of extinction. The Forest Service's response is a new "primary zoning" to protect animals such as wolverines and Canada lynx.

That primary zoning of 116,000 acres would reduce snowmobile terrain and might also quash more backcountry ski huts. At the very least, any new trails would have to be balanced by the abandonment of existing trails.

Rock Climbing

For the most part, rock climbing and mountaineering does not present a significant threat to wildlife, unless these activities occur in the same area as bird or bat nesting or roosting sites, or near ungulate winter ranges or natal areas. Mitigation of these impacts typically involves timing constraints on rock climbing activities.

On the Stawamus Chief (near Squamish), particular rock-climbing routes are closed by BC Parks from February to the end of July, allowing nesting Peregrine Falcons to successfully fledge their young. This is program is actively assisted by the climbing community in the Squamish area.

Climbers and others using cliff faces and their immediate environment need to be aware of the needs of cliff-dwelling animals.